INSIDE: SEARCHING EASTERN MONTANA FOR NORTH AMERICA'S RAREST MAMMAL

Montana Outdoors

MARCH–APRIL 2007

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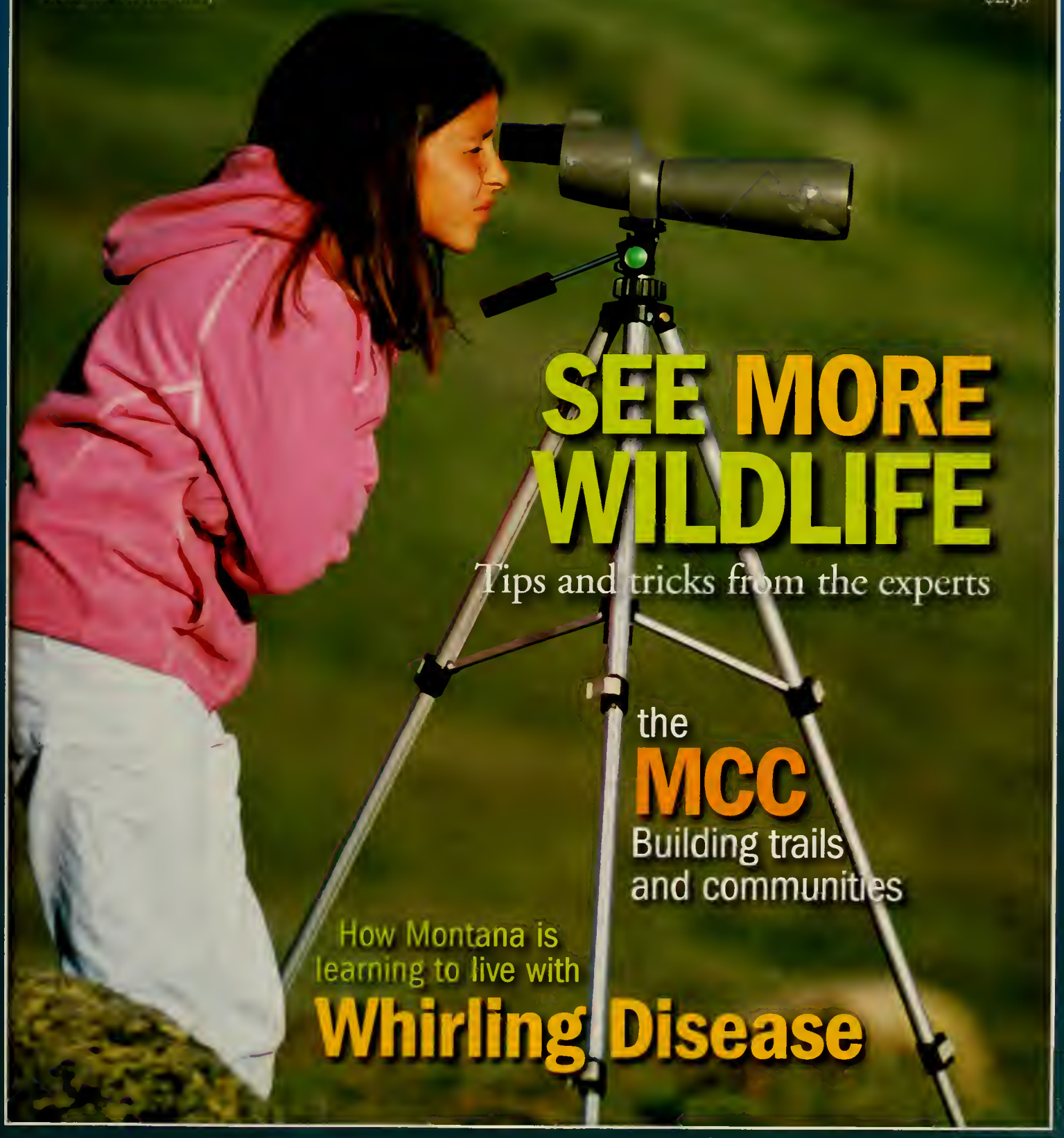

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Montana Outdoors

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JONO MCKINNEY/MCC

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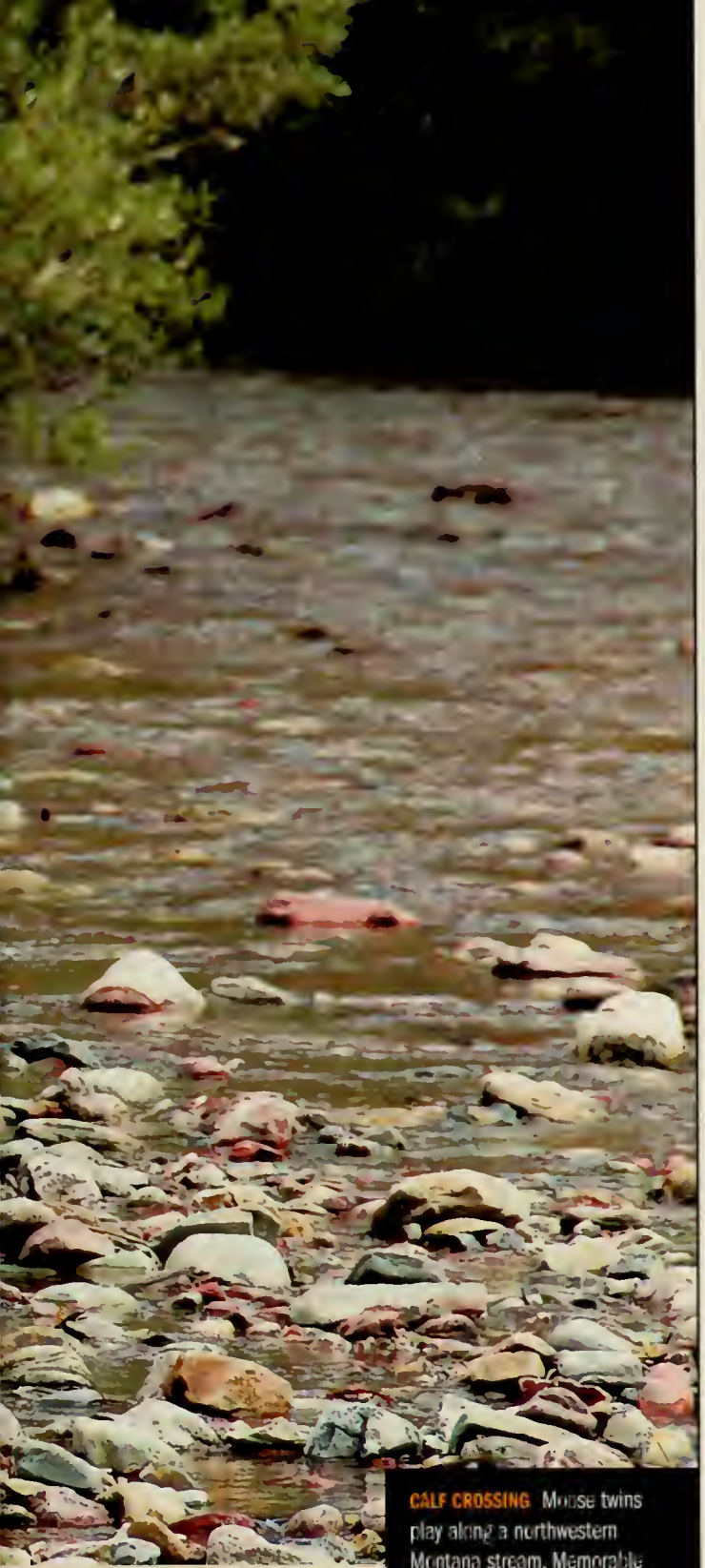

CALF CROSSING Moose twins play along a northwestern Montana stream. Memorable sightings like this are possible once you learn how and where to watch wildlife. See story on page 8. Photo by Tom Ulrich.

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COVER Wildlife watching is a fast-growing activity that attracts young people to the outdoors. See page 3 to learn what FWP is doing to ensure that no child is left inside. Photo by Jeff Henry.

Is license revocation a strong deterrent to poaching?

That was an excellent article by Dave Carty on how your state has clamped down on poachers ("Big Antlers and Big Egos," November–December 2006). I think Montana's most effective tool is not the high-dollar fine but the multi-state agreement that prevents offenders from buying licenses in other states.

George Houser
Burlington, Pennsylvania

Your article on poaching was very good and to the point. I am a resident of Iowa, and we also have a Turn-in-Poachers Program. In both Iowa and Montana, judges will revoke a poacher's hunting privileges for life. But I wonder: What do poachers care about that, for they most likely never buy a license anyway?

Larry Simpson
Des Moines, Iowa

No soul mate of Kerasote's

I enjoy your magazine and big game hunting, especially in Montana. Your article about poaching is dead on. There is way too much emphasis on trophy racks from all aspects of the hunting industry. As for "Three Long Seconds," (November–December 2006), I can easily do without a moralizing braggart. Author Ted Kerasote deems it necessary to lecture the lesser hunters in his midst about his superior abilities and moral standards; no thanks. *Montana Outdoors* can do quite well without printing his brand of tripe. Just because *Bugle* magazine and its millionaire crowd saw fit to print Mr. Kerasote's essay does not mean you should follow suit. If he believes an animal can "move and save your soul," he should give up hunting and hurry off to his PETA meeting.

Mark Wehr
Mifflinburg, Pennsylvania

Not huntable, yet

The Eurasian collared dove is becoming more and more common in Montana. Is this dove a legal target for Montana dove hunters?

Lew Melby
Glendive

Not yet, says Rick Northrup, FWP Upland Bird Program coordinator. "But FWP intends to bring a proposal before the FWP Commission to designate Eurasian collared doves as a wild bird that can be hunted without limits or a season, similar to the status of rock doves," he says. "In our proposal, Eurasian collared doves would not count toward the mourning dove daily bag limit."

Dishonest article?

Too bad the article on trapping ("Maintaining a Buckskin Lifestyle in a Polarfleece® World," November–December 2006) was not titled "Enough is Enough." I was sickened by the article, as I have always been with trapping. I wonder if those children on page 30 would have been so delighted to cuddle a fresh pelt with blood and scraps of meat and fat. Were they shown the joys of shooting or bludgeoning to death a helpless animal? Did you have them put their wrist in a leghold trap to see how it feels? It's dishonest to show the clean end result of trapping and not the reality of the practice. I hunted for almost 50 years, and every time I killed an animal I gave an Indian prayer for its soul to be returned to that of a newborn in the spring. I had great respect for the birds and big game I killed. I don't see that in trappers.

Lori Micken
Livingston

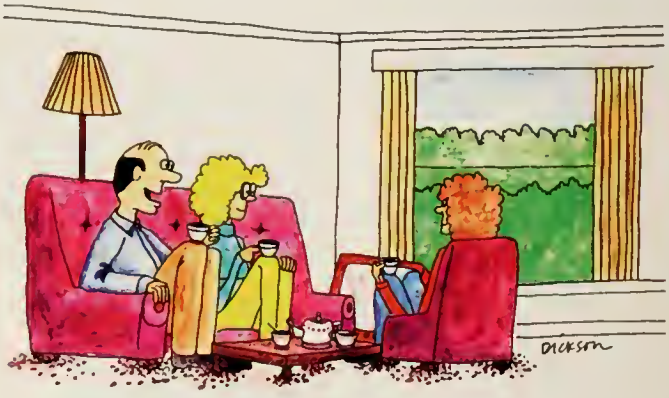
Not enough compensation?

I was inspired to write this letter after reflecting on the well-written article "Working It Out with Wolves" (July–August 2006). I was very proud to see that Montana FWP showed such balance in its evaluation of the impacts of wolf reintroduction. Like one of the families in the article, my family lost our first calf in the winter of 1999 to two wolves. They spent the winter on the ranch leaving their tracks on sidewalks and around our calving barn. Unfortunately for us, we were not reimbursed for the wolf kill because we could not find enough "proof" that wolves actually killed the calf (the calf was devoured entirely). Ranchers and other landowners provide excellent habitat and feed for a variety of wildlife, including wolves. When someone suggests that ranchers should not be reimbursed for livestock losses, as one letter writer did in your September–October issue, I can easily find reasons for ranchers to be compensated even more. Game such as elk and deer spend a significant amount of their time on private land, consuming crops and other forage at ranchers' expense. Ranchers are continually giving back to nature without compensation—it's part of their life. Problems arise when radical people with radical ideas make changes to supposedly benefit nature.

Beau McLean
Whitehall

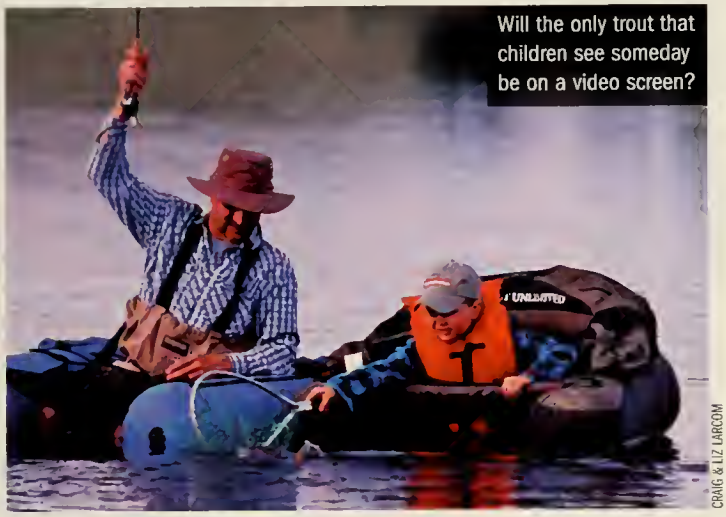
Corrections

Thanks to readers who wrote to point out that our picture of the Missouri headwaters on pages 18 and 19 of the November–December 2006 issue was reversed. Thanks also to those who correctly identified the hummingbird on page 2 of the January–February 2007 issue as a rufous and not a ruby-throated.



"So tell us, how long have you had beavers?"

TOM DICKSON


Will the only trout that children see someday be on a video screen?

CRAIG & LIZ LARCOM

No Child Left Inside

Do Montana children suffer from what child advocate Richard Louv calls "nature deficit"? Maybe not yet, but if the national trend outlined in Louv's 2005 book *Last Child in the Woods* continues to spread, our youngsters might soon find it harder to identify elk and walleyes than cartoon characters and rock music celebrities. That's a troubling prospect.

According to Louv and other experts, kids today spend far less time outdoors than they did in the past. Instead, youngsters nowadays are glued to indoor video games, computers, and MP3 players. The change is due in part to technological advancements, overdevelopment of woods and open space, and parents' unreasonable fear of natural and human predators. Experts say this "de-natured childhood" leads to increased levels of childhood stress, hyperactivity, and obesity.

One way to unplug kids is to introduce them to outdoor activities such as fishing, hunting, wildlife watching, camping, and boating. Through these and other outdoors pursuits, kids learn about fish and wildlife, see the splendor of Montana's various landscapes, and awaken their senses to natural wonders such as the sound of bugling elk, the smell of sage on a warm breeze, or the sight of cutthroat trout rising to fluttering caddis flies.

Montana Fish, Wildlife & Parks has a long tradition of enticing kids into the outdoors. Each year in 100 classrooms statewide, our Hooked on Fishing Program introduces 2,500 students to the joys of recreational angling and the fascinating world of fish and other aquatic life. And our community fishing ponds provide youngsters with easy access to catchable fish. Last year 17,000 Montana students visited state parks, where they learned about the state's natural and cultural resources in outdoor classrooms.

Through our Hunter Education Program, volunteer instructors teach and certify 10,000 youngsters each year—among the highest number per capita of any state. Because hunting is such an important part of Montana's culture, we have been working with hunting education experts and state lawmakers to find new ways to increase the number of kids recruited into the hunting ranks. One proposal would lower by a few years the age a resident youngster could hunt (the current minimum is 12 years old). Another would allow new hunters to waive the hunter education requirement for a year if they were hunting with an experienced, licensed adult hunter. The idea behind these "try before you buy" proposals is that more youngsters might take up hunting if it were easier to participate on a trial basis.

More anglers, hunters, and state park visitors is good for Montana and its fish and wildlife. For decades, fishing and hunting license fees have funded most fish and wildlife research, population monitoring, and habitat protection across the state. Outdoors enthusiasts contribute to nonprofit conservation groups and vote for initiatives and candidates that support the conservation of fish, wildlife, and open space.

This department continues to look for new ways to attract young people to hunting, fishing, wildlife watching, camping, boating, and other outdoor activities. We believe that time spent in the natural world creates more and better conservationists in the future. It also makes for healthier and happier kids today.

—M. Jeff Hagener, *Director, Montana Fish, Wildlife & Parks*

NATURAL WONDERS

Illustration by Peter Grosshauser

Q I've been reading about your bison hunt in Montana. Do any other states have bison hunts?

A Yes. Each year, wild bison are hunted (and harvested) in Alaska (100), Arizona (45 to 65), South Dakota (35), Utah (60), and Wyoming (42).

Q Who or what are the popular fishing towns Ennis and Livingston named after?

A William Ennis, one of the first men to settle in the Madison Valley, was the area's first postmaster. Crawford Livingston, a resident of St. Paul, Minnesota, was a director of the Northern Pacific Railroad, which for decades was the lifeblood of the Montana river town.

Q I've read about bears having twins. But what about triplets or even quadruplets?

A It happens. According to Jamie Jonkel, FWP bear management specialist in Missoula, most (roughly 90 percent) black and grizzly bear litters consist of two or three cubs. But if sows have enough food, they can produce quadruplets or even quintuplets.

WILLIAM LEONARD

Growing over a foot long, the Idaho giant is the largest salamander in Montana.

Scientists locate large, yelping salamanders in Montana

Researchers recently documented the existence of Idaho giant salamanders near Lookout Pass on Montana's western border. The species, one of the few salamanders to make a noise, was not known to exist in Montana.

In 2006, scientists and volunteers with the Montana Natural Heritage Program (MNHP) and University of Montana conducted an unprecedented salamander survey in western Montana to better document the amphibians' habitat and distribution. The work was funded by the U.S. Forest Service and a federal State Wildlife Grant administered by Montana FWP.

Bryce Maxell, MNHP senior zoologist who organized the survey, says the Idaho giant salamanders were found among moss-covered boulders and tiny pools at the headwaters of 15 mountain streams. The amphibians were found south of Interstate 90 near the towns of Saltese and Haugan.

"Many of these headwater streams had not been systematically surveyed in the past, and that's probably why the species went undetected for so long," Maxell says.

Idaho giant salamanders can reach 13 inches long, making them one of the largest salamanders in the Northwest. The secretive, night-loving creatures have distinctive marbling on their backs. Though most salamanders are voiceless, the Idaho giant can produce sounds ranging from a low growl to a high-pitched yelp.

Before the survey, scientists knew of only one undocumented report of the species living in Montana. Surveys by scientists and fisheries workers could not confirm that sighting.

In addition to various salamander species, the surveyors in 2006 also found Rocky Mountain tailed frogs and several rare terrestrial snails, and recorded new locations of fish species in headwater streams of the Bitterroot Mountains.

Find your inner outdoorswoman

For the past 14 years, Montana's Becoming an Outdoors-Woman Program has taught more than 1,500 women how to build a survival shelter, cast a fly rod, shoot a rifle, cook meals in a Dutch oven, and other basic outdoors skills.

This year's three-day weekend workshop will be at the Lubrecht Experimental Forest near Missoula June 29–July 1. The $195 fee includes class instruction, meals, and lodging. Partial scholarships are available. Space is limited, so sign up soon by calling program coordinator Liz Lodman at (406) 444-2615 or e-mailing her at llodman@mt.gov.

MONTANA FWP

BOW workshops provide women an opportunity to learn outdoors skills such as archery in a fun and supportive environment.

FWP will also be offering single-topic BOW workshops on upland bird hunting (in Great Falls), walleye fishing (in Glasgow), and deer and elk hunting (in Charlo). Dates and details will be announced later on the FWP website: fwp.mt.gov.

Montanans tax themselves to keep land open

Largely absent in the news about the November 2006 elections was the fate of bond initiatives preserving open space in two

SuperTag winners have super hunts

Ryan Stratman of Bozeman doesn't know which was more fun: winning the mountain goat SuperTag last July, the 20-plus days he spent with two friends in the mountains near Bozeman scouting for the high-country animals, or the actual hunt itself.

"The whole thing was the best hunting experience of my life," says Stratman, a sergeant with the Gallatin County Sheriff's Office.

The highlight for bighorn sheep SuperTag winner Steve Carson of Helena was visiting seven different hunting districts during the season and glassing dozens of rams. He eventually killed a big ram on the Lost Creek Wildlife Management Area north of Anaconda. Carson says he didn't care about getting into the record books. "I wanted a good ram, which I got, and I wanted to see a lot of legal rams. I think over the course of the season I saw more than 100," he says.

Though sheep can often be easy to hunt when they come down from the high country in November to breed, Carson was fortunate to have a challenging hunt. "I hiked in, and he was by himself on a beautiful grassy knoll," he says.

Stratman with his mountain goat.

Carson, who works for FWP as a database manager, made a taxidermy shoulder mount of the ram. "Every time I look at it I think of how much fun my wife and I had going out to look for sheep," he says.

John Enright, age 14, filled his moose SuperTag on the last day of the season. Hunting with his father and family friends, the Great Falls teen had hunted all fall without an opportunity to shoot a bull. He downed the cow moose with a single shot with just a few minutes of shooting light remaining.

fast-growing but politically dissimilar western Montana areas.

In conservative Ravalli County, the county's first bond to preserve open space, a $10 million initiative, passed with 58 percent of the vote. In liberal Missoula County, a $10 million initiative passed even more decisively.

According to the conservation nonprofit Trust for Public Land, the initiatives were patt of a nationwide trend in which 99 of 129 conservation tax or bond initiatives on the ballot in 23 states passed in the recent elections.

Even in land-rich states such as Montana, open space is fast disappearing. Housing and commercial developments eat up land once accessible for hiking, hunting, fishing, and wildlife watching. Land conservationists note that western and central Montana's growing population and rampant rural sprawl don't give communities much choice.

"People are seeing that bond initiatives are one of the only ways they can preserve open space near where they live," says Karen Knudsen, chair of the Open Space Committee appointed by the Missoula City Council.

Wildlife trumps wildcatters on the Front

Hunters, outfitters, anglers, backpackers, and others celebrated last December when Congress passed a last-minute tax extender bill with a rider banning oil, gas, and mineral exploration on public land in western Montana's Rocky Mountain Front. President George W. Bush is expected to sign the bill in eatly 2007.

Senator Max Baucus added the fossil fuel provision to the larger tax package in the final days of the Senate session. The provision makes permanent a 1997 moratorium on oil, gas, and mineral exploration on the Front and makes it easier for the federal government to retire existing leases. Eatlier in the year, former Senator Conrad Burns had introduced a similar provision that did not pass. Representative Dennis Rehberg opposed the ban, saying that drilling is essential at a time when the country cannot meet its energy demands.

The Front, which stretches roughly 100 miles south from Glacier National Park, is considered one of the most remote and wildlife-tich ecosystems in the lowet United States.

The drilling ban gives oil and gas companies a tax break if they sell their leases on the Front to nonprofit groups. Several companies had already agreed to sell leases to the Coalition to Protect the Rocky Mountain Front and other conservation groups. The new bill will likely encourage more to do the same.

JEFFVANTINE.COM

In December 2006, Congress passed a bill that will protect the Rocky Mountain Front from oil and gas drilling.

SuperTag winner Carson and his ram.

Ed Clark opted to not fill his deer SuperTag. An accomplished deer hunter, the Whitefish resident says he was hoping for a trophy buck larger than anything he'd previously shot. Though he spotted many big bucks in southwestern Montana where he hunted for six days, none were quite large enough.

Elk SuperTag winner Joseph Danca, from the Chicago area, spent two weeks in Montana unsuccessfully looking for a big bull. Then he headed to Arizona, where he'd drawn a coveted mule deer buck archery tag, then to Wyoming for a hunt, then back to Montana for a deer hunt. He finally got his big bull in January during Montana's late-season Gardiner hunt.

The SuperTag Program raised roughly $325,000 in its first year. Hunters bought 6,639 $5 chances for deer, 17,103 for elk, 20,700 for bighorn sheep, 7,350 for mountain goat, and 13,120 for moose. The computer drawing was held in July.

Ron Aasheim, head of FWP's Conservation Education Division, says the department is holding the popular SuperTag lotteries again in 2007. "Hunters were real excited about this extra opportunity to apply for a permit for these big game species," he says. "People told us they appreciate that the money goes to enhance public hunting access and boost game law enforcement." Aasheim adds that a bill has been introduced to include SuperTags for mountain lion, pronghorn antelope, and bison in the future.

Stratman says he'll buy another SuperTag chance for mountain goat as well as bighorn sheep and moose. And though he wouldn't mind winning again someday—or just getting drawn in the regular permit process—what he really wants is for his two hunting partners to get drawn. "I'd really like to be able to help them out on their hunt like they helped me out," he says. "I owe them both big time."

In early 2006, photographer Don Jones of Troy heard rumors that snowy owls were congregating near Pablo, a few miles south of Flathead Lake. Snowy owls breed in the Arctic and winter throughout Canada and occasionally the northern Great Plains. Every few years, a drop in the lemming population (the owls' primary food) will send the raptors even farther south in search of prey. During early 2006, roughly 30 to 40 snowy owls were recorded around Montana's Mission Mountains. Jones received permission from a farmer to set up his blind near a pivot irrigator in a potato field, where he took this shot. "That female was flying back and forth between a fence post and the irrigator," he says. "I think she was just playing. I took the shot right when she was looking back at the pivot." ■

Where's the Wildlife?

Montana may well be the nation's top state for viewing wildlife. Wildlife watchers can see large mammals such as grizzly bears, gray wolves, elk, bighorn sheep, antelope, and mountain goats. They can also view a wide range of mountain and prairie birds, from great gray owls to sage grouse, as well as small mammals such as pine martens, prairie dogs, and hoary marmots. What's more, Montana's abundant national parks, forests, wilderness areas, and wildlife refuges, as well as state wildlife management areas and parks, provide a dizzying number of places statewide to see wild critters.

"Another reason Montana is such a great place for wildlife watching is that much of the landscape is so wide open, so you can really see things," says Thomas Baumeister, an avid hunter and wildlife watcher who heads the Montana Fish, Wildlife & Parks Education Bureau.

Watching wildlife can be easy. Travel any country road at dusk and you'll see dozens if not hundreds of mule and white-tailed deer. Drive nearly anywhere in the state's eastern half and you're bound to spot golden eagles, ferruginous hawks, and northern harriers. Walk a mountain trail and a Clark's nutcracker, red squirrel, or yellow-pine chipmunk will no doubt cross your path.

But to see wildlife other than those lingering along trails and highways, you need to learn a few tricks developed by birders, hunters, photographers, and others who are expert at spotting animals the rest of us might miss. Follow their advice and you will start to see more of the wildlife that has made Montana so famous.

Off the beaten path

Too many people watch wildlife from behind the steering wheel, and that severely limits what they see, says John Fraley, who manages FWP's Regional Information and Education Program in Kalispell. "Get out and walk, away from the roads," he says. When teaching kids to watch wildlife, Fraley sometimes has them lie on the ground and gaze up into the trees. "You'd be amazed at the whole world of insect and bird habitat up there," he says.

One of the best places to find wildlife is near water. At ponds, streams, wetlands, and lakes, look for warblers and songbirds, as well as moose munching underwater vegetation, mink hunting along the shoreline, and muskrats gathering reeds for their nests.

"Even in the middle of town, water attracts wildlife of all types," says Kristi DuBois, FWP Native Species Program coordinator. "It amazes me what you can see along an urban river corridor or next to a pond in a city park."

Wild animals also congregate where two or

A BETTER LOOK Whether you're looking at distant wildlife such as grizzly bears in Glacier National Park (left) or watching wildlife up close (grizzly bear cub, right), learning about wild animal behavior and habitat can enhance your viewing experience.

In Montana, it's everywhere. You just have to learn how to see it.

BY BECKY LOMAX

more different habitats collide, such as the intersections of grasslands and forests. Elk wander among aspen groves that break into intermittent prairies. Ptarmigan hang out where small, twisted subalpine fir trees grow in wildflower meadows. In late summer, grizzlies frequent brushy riparian areas spilling down from mountainsides.

The best time to see wildlife is at dawn and dusk, when songbirds sing, warerfowl fly, and browsers such as deer and elk feed. The first and last hours of sunlight also provide the best conditions for photography, due to the golden tones and lack of harsh shadows from the overhead sun.

Sitting quietly may be a dying art these days, but it's one worth cultivating if you want to see wildlife. DuBois points out that wild animals can detect your slightest motion. "Many animals will even see you turn your head, so you really need to stay

DONALDMJONES.COM

Be alert The single best piece of wildlife-watching advice is also one of the hardest to follow: Be alert. The trick is to heighten your senses of hearing, sight, and even smell whenever outdoors.

still once you get into a position where you think wildlife is present," she says. Move your eyes back and forth to look for critters while keeping head movement to a minimum. Better yet, use binoculars or a spotting scope to stay away from wildlife so they don't see you and continue behaving naturally.

Blend in

Wildlife watchers can take a lesson from waterfowlers and bowhunters, who use blinds and camouflage to blend in with natural surroundings and thus avoid detection. Use boulders, trees, brush, and other natural objects to hide from the animals you're observing. Follow swales in open areas to move closer to distant pronghorn or deer without being detected. Move slowly and quietly, and avoid walking along hilltops and ridges, where your silhouette is broadcast to any animal below.

Wear drab, natural colors. Birds are especially well equipped with eyesight that can detect bright colors, so leave that fluorescent pink cap at home. "Some birders go all out and wear duck hunting camo if seeking out a particularly skittish bird," DuBois says.

Perfume, cologne, and scented deodorants are other wildlife-watching no-nos. Many species, such as deer, elk, and bears, have an excellent sense of smell and will catch a whiff of Old Spice or Obsession and be gone before you even enter the woods. (Bowhunters go so far as to wash their clothing in scent-removing soap or wear scent-blocking bodysuits in order to avoid detection.)

Other tips: When the sun is out, cover or remove any reflective objects, such as glasses hanging from pockets, bright jewelry, and camera lenses. And leave the dog at home. Dogs are great outdoors companions, but they will spook most wildlife other than birds high up in trees.

Learn about animals

The more you know about wildlife, the more likely you'll be able to find animals, get close, and enjoy the experience of watching them. Learn all you can about a species, including its various habitats, seasonal migrations and movements, daily patterns, and food sources. Bighorn sheep, for example, have a daily U-shaped pattern: In late morning, they move down from safe cliffs to open meadows for daytime grazing, then climb back into the cliffs at night. Knowing about animals will help you zero in on the right habitat. For example, you won't find a pine marten in a prairie wetland, and if you want to see sage grouse, you first need to find large expanses of sagebrush habitat.

Your behavior can make animals nervous or calm. Avoid creeping toward deer and elk like a predator; relax and walk casually. And if you wish to get closer, move around animals instead of walking directly at them. Look at their body or the background vegetation rather than staring them in the eye, which makes prey animals nervous (and makes predators think you're challenging them). Resist the urge to whistle to make an animal turn around. Your goal, after all, is to

DIVERSE HABITATS, DIVERSE WILDLIFE
Montana is home to 600 vertebrate species, ranging from bison weighing over a ton to shrews weighing less than a penny. That wildlife diversity is due to the state's diversity of native plant communities, including sage brushlands, shortgrass prairie, salt flats, mixed broad-leaf forests, mountain streams, and riparian wetlands. Clockwise from near right: Pine marten in a conifer forest, moose in a shrub swamp, beaver in a prairie wetland, and mountain goat in an alpine meadow.

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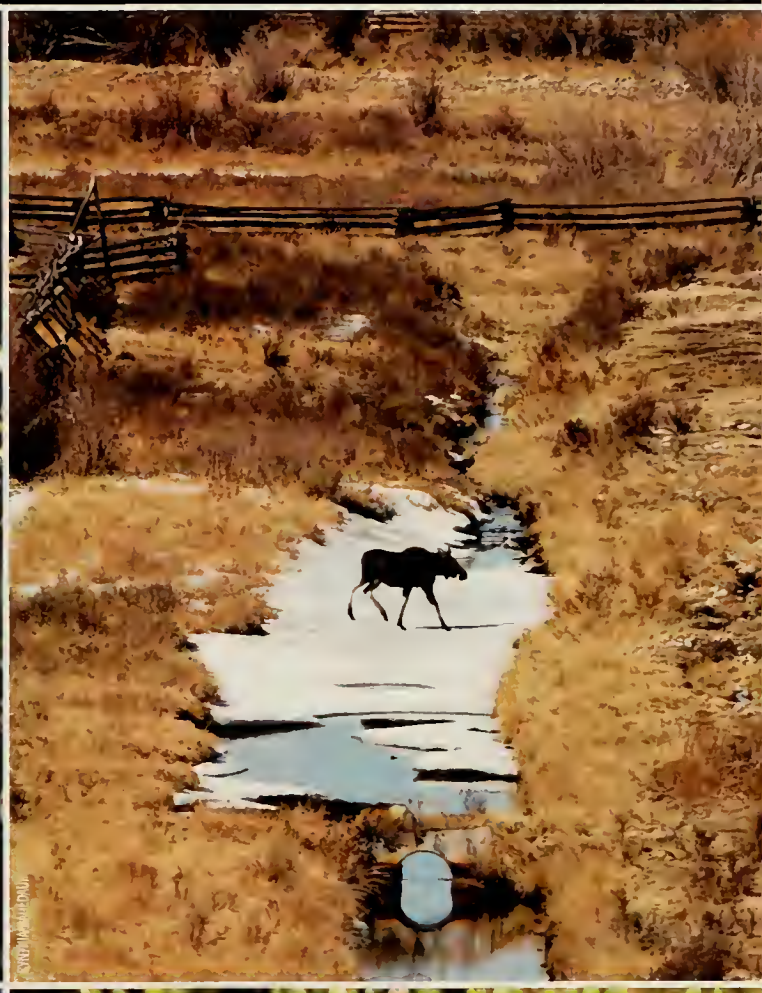
Freelance writer Becky Lomax of Whitefish was a backpacking guide in Glacier National Park for nine years.



watch wild animals going about their normal business, not reacting to disruptive human behavior.

Let wildlife behavior guide your behavior. If a resting bighorn sheep stands up, that means you are crowding it. The same is true if you see a nearby mountain goat with its little tail sticking straight up. And if a mule deer steps away, you are too close and need to back off.

The advice is especially true for both grizzly and black bears. "A bear can sense your presence, but it may not see you," warns John Waller, wildlife biologist in Glacier National Park. "Sneaking up on a bear is never a good idea. If you see a change in its behavior as you approach, you need to back away slowly but immediately."

DEA VOGEL

"DAD, IS THAT A MUSK OX?" Wildlife watching is a great way to lure kids into the outdoors.

DuBois notes that the best way to know whether you are "pushing an animal's envelope" is to understand what it is communicating with its behavior. "Sometimes, people will completely misinterpret what an animal does," she says. For example, common loons sometimes approach a boat while crooning their gorgeous songs. Many boaters take this as a sign of the bird's friendliness. But the loon is actually alarmed, fearful the boat will injure its chicks; its "song" is a desperate warning cry.

How do you learn more about the wildlife you hope to watch? The Internet contains more information than a person could digest in a lifetime. A comprehensive field guide is another indispensable wildlife-watching tool. "But you probably don't need to actually use the field guide out in the field," advises Baumeister, the FWP education chief. "That can be too cumbersome, and you end up looking at the book rather than the animals. I recommend that you watch the wildlife and try to remember as much about the animal and its surroundings as you can. Then go back to your vehicle or home and use the field guide to refine your experience."

Be alert

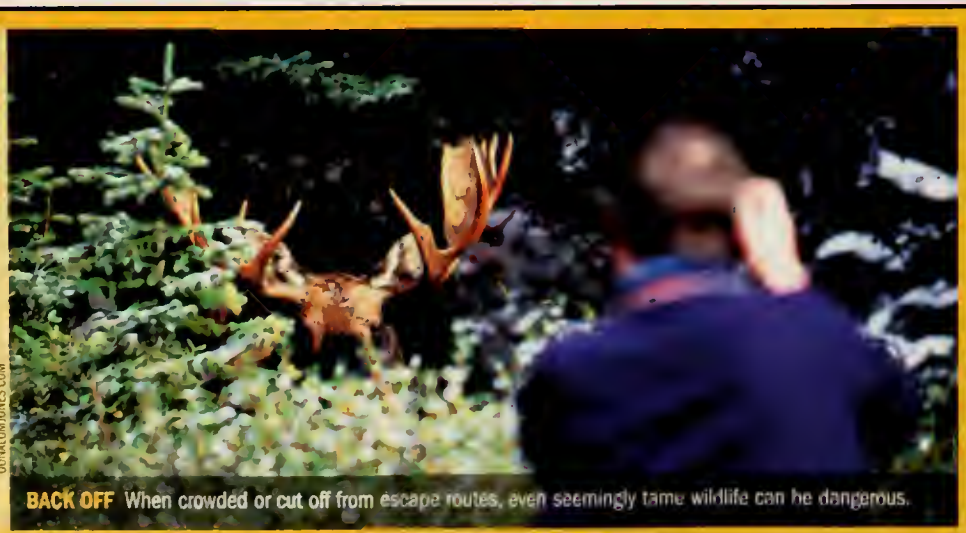
The single best piece of wildlife-watching advice is also one of the hardest to follow: Be alert. The trick is to heighten your senses of hearing, sight, and even smell whenever outdoors. If you don't see an animal after waiting at a likely place, look for signs of its presence, such as tracks, scat, diggings, or nests. Sniff the air: Deer, elk, and foxes often give off odors. Listen: Songbirds aren't the only wildlife making sounds; cow elk mew like cats, alarmed whitetails snort, raptors scream, and feeding ducks chuckle.

Keep your wildlife-watching radar on at all times whenever you're outside. Even while driving to the grocery store, you may spot an osprey sitting in a stick nest piled atop a telephone pole, a pheasant pecking gravel along the road, or a red fox squatting beside its hole.

Baumeister says one way to increase alertness is to always wonder about what you see and hear. For example, when he hears a raven caw, he wonders if the sound will lead him to another animal. "It could be harassing a red-tailed hawk or following a coyote that might be tracking a rabbit," he says.

When it comes to seeing wildlife, a keen imagination and lively curiosity can be just as important as even the sharpest eyesight.

To learn more about wildlife, check out the Montana Animal Field Guide on the FWP website (fwp.mt.gov, under "Wild Things"), or take a class or field trip sponsored by FWP, local Audubon chapters, the Montana Wilderness Association, the Glacier or Yellowstone institutes, or other conservation education organizations. For additional advice on watching wildlife, search "wildlife watching tips" on the FWP website.



DONALOMJONES.COM

BACK OFF When crowded or cut off from escape routes, even seemingly tame wildlife can be dangerous.

Safe Viewing

A cow moose may appear docile. But if it senses that you are threatening its calf, that 700-pound animal can maim or kill a person with its sharp hooves. Even smaller mammals such as badgers can be dangerous when cornered or blocked from their burrows.

When watching wild animals that let you approach closely, resist the urge to act like you're in a petting zoo. "A close observation is

READ THIS TAIL. Wildlife often provide clues that indicate their mood. For example, an animal that remains bedded is usually relaxed and not bothered by your presence. But when it stands up, you know you've walked too close.

definitely a memorable experience," says Thomas Baumeister, head of FWP's Education Bureau. "But you need to be sure to not put an animal or yourself in jeopardy. That's why we recommend keeping a safe distance."

How close is safe depends on the species, the individual animal, and the situation. To keep from disturbing nesting eagles or other raptors, for example, stay at least 400 yards away. When boating, stay out of bays where loons are nesting in spring and early summer. Yellowstone National Park prohibits anyone from approaching within 100 yards of a bear and 25 yards of other wildlife species. Glacier National Park is even more conservative, recommending you maintain a distance of at least 400 yards between you and a bear.

Other wildlife-watching safety advice:

- **Use high-power binoculars** or a spotting scope to watch wild animals from a distance without bothering them or putting yourself or others in danger. For photography, use a telephoto lens.
- **Don't feed wildlife.** Feeding animals conditions them to people, which can create dangerous situations; even deer have been known to attack people who get too close. Most wild animals that attack people have to be killed by wildlife officials to prevent another incident.
- **Prepare for the unexpected.** For example, a bear feeding peacefully on huckleberries may seem like a tranquil scene, but the situation could change in seconds. "If a bigger bear comes in and chases that bear, you may quickly find yourself in the middle of a dangerous fight between combatants," says John Waller, a Glacier National Park wildlife biologist.

IN FINE WORKING ORDER

It takes expertise, money, innovation, and a stubborn sense of thrift to keep Montana's 50 state parks and 320 fishing access sites clean, safe, and functional.

By Will Harmon
Photos by FWP Parks Division

It's a fine and typical Montana spring morning—alternately sunny and snowing—as my tires crunch on the gravel road leading into Salmon Lake State Park just north of the intersection of Montana Highways 200 and 83. Other than a few fidgety chickadees in the pines, the place is deserted, a ghost town of picnic tables and campfire grills.

Deserted, but clearly not neglected. There's not a speck of litter on the ground, the picnic tables are in good trim, and the fire rings have been cleared of trash and coals. The restroom is spotless and odor-free but for a faint whiff of bleach. And there's no trace of graffiti, bullet holes, or other vandalism that can plague remote public recreation sites. The tidiness is palpable, a welcome respite, making it easy to

FIRED UP FWP Parks Division maintenance workers say they enjoy the diversity and challenge of their jobs, whether it's installing signs outdoors, sharpening blades in the maintenance shop, or attending to the hundreds of other chores required to maintain state parks and fishing access sites across Montana.

The tasks and skills required of maintenance workers run the g

On any given day they can be building fences or signs, painting structures, or installing new concrete vault latrines or boat docks. Their responsibilit Maintenance workers mow lawns, clean boat ramps, haul gravel, and build roads. They install culverts, cattle guards, and gates, as well as control w winterize irrigation systems, pour concrete sidewalks, build and maintain trails, replace doors and locksets on latrines, and test drinking water. Ad installing traffic counters, and locating site boundaries. At historic sites such as Bannack State Park, they also do historical renovation such as repla In the regional shops, maintenance crews overhaul equipment and tools as well as build cabinets, gates, signs, self-pay stations, picnic tables, bulle

enjoy the sunlight dappling the trees and the murmur of the water lapping on the beach. Salmon Lake is a well-kept oasis of public access and recreation. It's also just one of nearly 400 recreation sites managed and maintained by the Parks Division of Montana Fish, Wildlife & Parks.

Most people don't notice the finer points of site maintenance. "We aim to get the job done with the least disturbance to visitors as possible," says Doug Frazier, regional maintenance supervisor in Missoula and a 29-year Parks Division veteran. "We try to take care of litter and vandalism as soon as it happens, so the next people who arrive won't have to see it."

Frazier notes that when a park is kept clean and in good repair, it takes less effort to keep it that way. "We've found that people are less likely to mess up a tidy park," he says. "Good 'curb appeal' reduces littering, vandalism, and other problems."

Reduce perhaps, but never eliminate. Maintenance remains a daunting task. In 2005, there were more than 1.75 million visits to Montana's 50 state parks, and an estimated 4 million visits to the 320 designated fishing access sites (FAS) the Parks Division also manages. (Most site users—70 to 80 percent—are Montana residents.) Though maintaining parks is done by everyone in the Parks Division, it's the primary responsibility of roughly 19 permanent, full-time staff. These maintenance workers are charged with accommodating the steady stream of visitors while preserving the scenery, habitat, facilities, and other features that draw people to the sites in the first place. In addition, a small army of caretakers and other seasonal employees handles day-to-day maintenance at specific parks and clusters of FAS during the busy summer months. Jerry Dean, southeastern region maintenance supervisor in Miles City, likes to hire retired Montana ranchers and farmers for this seasonal work. "They know maintenance as well as anyone alive, and they have a strong work ethic," Dean explains.

Volunteers from local communities also help with light maintenance, such as cleaning, fencing, and minor repairs. When necessary, FWP contracts with private businesses for services such as pumping vault toilets, grading roads, abating dust, and controlling weeds.

Many uses, many duties

Montana's state parks system supports a wide array of uses, including boating, fishing, hiking, wildlife watching, hunting, camping, picnicking, photography, educational field trips, historical and archeological research, and cultural interpretation. Some parks are also used for weddings, family reunions, and other special events.

Given this variety of uses, it's not surprising that parks run from unspoiled natural areas to highly developed urban playgrounds. Some state parks only have a parking lot and trails. Others feature showers, flush toilets, playground equipment, boat ramps and docks, concession buildings, and state-of-the-art visitor centers. All of it requires maintenance.

"We try to take care of litter and vandalism as soon as it happens, so the next visitors who arrive won't have to see it."

Because the scope of their work is so broad, maintenance team members must master many trades. I got to see that as Frazier and his right-hand man, Morgan Dollinger, closed Placid Lake State Park for the winter season. Within 45 minutes they repaired a jammed lockset on a restroom door, drained and winterized the plumbing in the main shower building, shut down the electrical system, covered signs and windows, and welded a broken fire grill. Without missing a beat, they also scoured the grounds for litter, checked the perimeter fence line, and made notes for next year's road grading and tree pruning.

Dollinger says the variety of work is a major attraction of the job, but the sheer volume of maintenance tasks requires careful planning. "We keep a list of all the maintenance needs at every site, so we have several jobs in mind before we drive all the way out here," he says. "Our van is stocked with a wide range of tools, bolts, nuts, and other supplies so we can be as efficient as possible when we're out in the field."

Dollinger makes major repairs and fabrications at the shop, and then trailers the project to the site for installation. "This minimizes any intrusion on park visitors," he says.

Nevertheless, maintenance crews spend much of their time at the parks and fishing access sites, where they frequently come into contact with anglers, picnickers, and other visitors. "It seems like I'm always answering questions about fishing, wildlife, vegetation, local history, and general Fish, Wildlife & Parks information," says John Taillie, a maintenance worker based in Bozeman.

Maintenance work is expensive. Most of the

Will Harmon is a freelance writer in Helena specializing in natural resources management.

nut from plumbing to plowing.

lso include repairing broken water lines in latrines and roofing buildings.
, cut hazard trees, and do landscaping. Also on the work list: Repair and
that the building of jack-leg fence, picking up trash, mowing roadsides,
sill logs and cedar shingles, re-glazing windows, and chinking log cabins.
oards, cattle guard wings, and trailers.

Clockwise from top right: Maintenance workers stain a fee station, mow a picnic area, clean a restroom, and build a picnic shelter

"My mechanic, a retired rancher, is of the mind that when something's broken, you don't replace it, you just take it apart and fix it."

FWP Parks Division's $5 million annual budget goes to maintenance and related expenses. FWP buys or hires heavy equipment such as road graders and backhoes as well as dump trucks, trailers, mowers, tractors, weed trimmers, and water tanks. Prices for lumber used to build signs, sheds, picnic shelters, and other buildings continue to rise. In the Missoula region alone, maintenance crews maintain more than 350 picnic tables and install nearly 4,000 rolls of toilet paper each year. Contractors charge up to $150 an hour to pump out a vault toilet—and with nearly 6 million visits to state parks and FAS each year, the roughly 300 toilets at those sites need constant attention.

Mileage is another major expense, especially with constantly fluctuating fuel prices. Though maintenance workers schedule multiple site visits for each trip afield, some parks and FAS can be two or more hours from the regional headquarters.

Several years ago, FWP faced an alarming backlog of essential maintenance work due to lack of funds. Increased funding from the $4 voluntary license plate fee (instituted in 2004) has helped. "We're finally beginning to get ahead on what for years were chronic maintenance issues like road repair, restroom vandalism, and fencing," says Tom Greason, maintenance supervisor in the Bozeman region. This past October, his crews reconstructed the gravel road into Grey Cliff FAS on the lower Madison River, the most heavily fished river in Montana.

The new funding helps, but it's still not enough to fill all the park and access site maintenance needs. John Harwood, former maintenance supervisor in the Billings region, says that one way FWP gets things done with limited resources is through teamwork. Each regional maintenance supervisor regularly

MY WELL-LIT OFFICE

by John Taillie

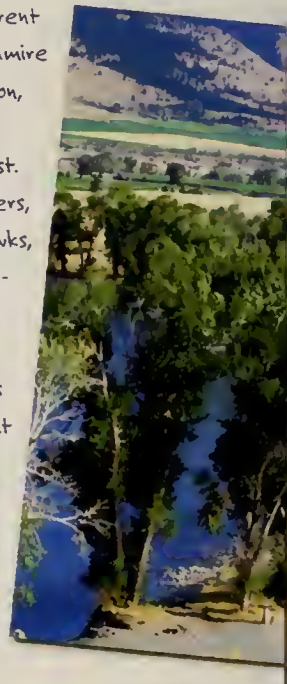
It's 7 a.m. on a Monday. The sky is a brilliant blue, with a few low clouds hanging over the mountains that surround the Gallatin Valley. A few feisty magpies balance on a fence and chatter while I load my pickup with tools and supplies for the day. I pull out of the yard and head into what I like to think of as my "office."

It's a big space with some mighty fine views. It encompasses over 90 fishing access sites on nine different river drainages in southwestern Montana. One day I might work along the Yellowstone River and get to admire the rugged peaks of the Absaroka Range. The next I could travel to the Big Hole, Ruby, Madison, Jefferson, Beaverhead, Gallatin, or Missouri rivers.

The fishing access sites I maintain have names like Paradise, Salmon Fly, Grey Owl, and Mallards Rest. As the names indicate, I share my office with others. Among my fellow occupants are antelope, elk, beavers, moose, coyotes, deer, and bears. Trout and grayling rise for caddis flies and mayflies. Eagles, swans, hawks, cranes, pelicans, and various waterfowl also frequent these renowned waters that wind through lush valleys often shadowed by towering mountains.

My office is not climate controlled. A thundershower may appear from nowhere and soak me to the skin. Snow squalls are common during the winter, and it gets hot here in midsummer. Yet the air is always clean, and the full-spectrum lighting is always on. My workspace lacks carpeting and framed artwork, but it does have the distinction of being decorated with living wildflowers, cottonwoods, willows, and pines.

The work I do is not easy. But I enjoy spending each workday making Montana state parks and fishing access sites cleaner, safer, and more accessible and experiencing the diversity and richness of Montana's natural beauty right from my office.



—John Taillie is a Parks Division maintenance worker in Bozeman.

The firewood dispenser at Salmon Lake State Park shows how maintenance workers keep costs down while improving customer service. When a visitor puts money in the slot, an electric motor slides a wood bundle onto a conveyor belt, which delivers it to a small door. The device saves time and ensures park users always have wood available in peak season.

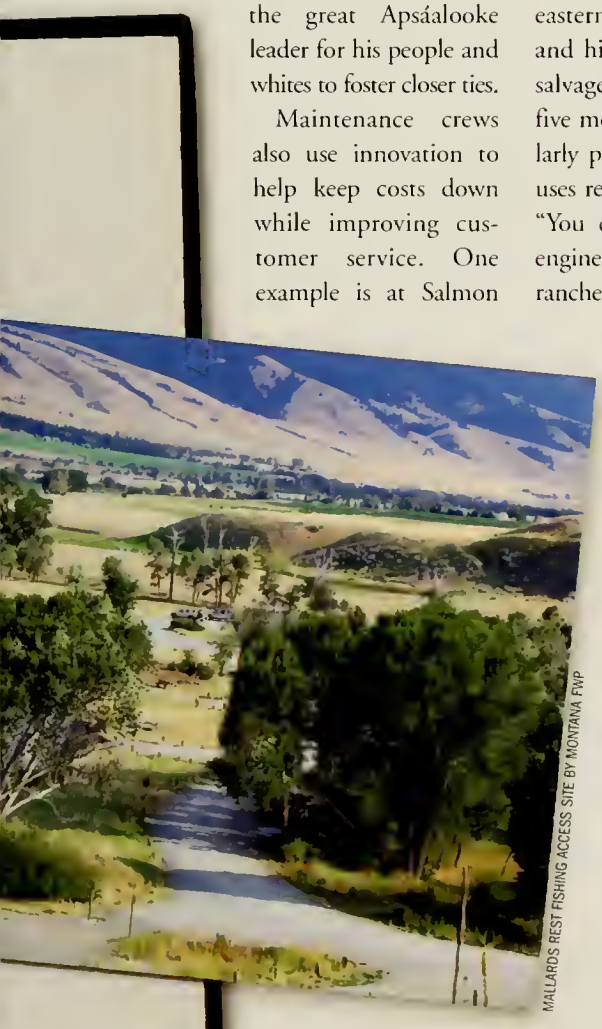
meets with the regional parks manager and park managers to identify the most pressing maintenance needs and who should do what. "Some routine maintenance can be done by park staff more cost effectively than bringing in maintenance crews," Harwood says.

Another way state patks do more with less is by teaming up with community and civic groups. Members of the Apsáalooke (Crow) Tribe, for example, participate in much of the management and maintenance of Chief Plenty Coups State Park to keep the heavily visited site in tiptop shape. The cooperation also helps fulfill a wish by the great Apsáalooke leader for his people and whites to foster closer ties.

Maintenance crews also use innovation to help keep costs down while improving customer service. One example is at Salmon Lake State Park, where the campground host spent hours each week during the high season stocking and selling fitewood. To free the host to do other chores, Frazier and Dollinger invented, designed, and built an automatic firewood vending machine. Housed in a small wooden hut that blends into the natural surroundings, the machine supplies firewood to campers like a soda machine dispensing cans of pop.

Thtiftiness is another hallmark of the maintenance staff. Supervisors buy supplies in bulk and use one brand of chainsaw and weed cutter to save costs on replacement patts. Southeastern region maintenance supervisor Dean and his crew routinely rebuild old mowers salvaged from state stocks, often eking out five more years of hard use. Dean is particularly proud of a 1978 dump truck his crew uses regularly. It has 1.2 million miles on it. "You can always overhaul these old diesel engines," says Dean. "My mechanic, a retired rancher, is of the mind that when something's broken, you don't replace it, you just take it apart and fix it."

Thrift, innovation, expertise, and pride are all hallmarks of the maintenance crew members who keep state parks and fishing access sites in fine working order. It's difficult work, especially considering Montana's brutal winter and summer weather, along with ever-increasing visitation, which combine to put a constant strain on the buildings, grounds, and other facilities across the state. "But the work has its rewards," says Taillie, the Bozeman-based maintenance worker. "We enrich people's experience while they are hunting, fishing, boating, camping, and recreating all across Montana."



MALLARDS REST FISHING ACCESS SITE BY MONTANA FWP

From bolts to backhoes

A typical FWP maintenance garage holds a wide array of tools and supplies required to keep state parks and FAS clean, safe, and functional. Maintenance workers must know how to use this equipment safely and keep it in good repair. Open the door of a maintenance shop and you'll see a water pump, power auger, compressor, generator, jackhammer, paint sprayer, cement mixer, sand blaster, power washer, and several chainsaws. On a rack hang ladders, axes, shovels, rakes, picks, pitchforks, sledge hammers, crosscut saws, spud bars, log peaveys, Pulaskis, and brooms. Stacked on the floor are rolls of wire, wire stretchers, post-pounders, and electric fence, along with pumps, fittings, pipe, and gaskets. Cleaning supplies include cases of toilet paper and boxes of garbage sacks. In one area sit sacks of cement, lime, and sand. In another are buckets of chain, spools of electrical wire, chest waders, plywood, and a cabinet full of fasteners. Another storage garage contains lawn mowers and tractors, weed trimmers, an ATV, and a large farm tractor with attachments including a mower, post-pounder, and auger. Lumber is stacked on racks.

THE SHOP If it's not here, they don't need it.

Outside sits a dump truck and equipment trailer, backhoe, utility trailers, fencing materials, culverts, cattle guards, a rack of PVC and galvanized pipe, new picnic tables, and a water tank. A flammables cabinet contains adhesives, paint, stains, solvents, thinners, varnish, brushes, rollers, and a spray gun. The shop also has a table saw, radial arm saw, and power miter saw. Beside a green canvas welding screen there is a steel workbench with vise, fume exhauster, drill press, acetylene torch, wire feed welder, grinder, chop saw, and a cabinet full of clamps, welding rods, helmets, and gloves. Additional cabinets contain even more tools and hardware that are used, like everything in the shop, to maintain Montana's system of state parks and fishing access sites.

Learning to Live with WHIRLING DISEASE

This trout killer may not be as deadly as once feared, but it's still a potential threat to Montana's coldwater fisheries.

By Brian Maffly and Tom Dickson

Whirling disease has defied expectations ever since biologists fingered a European parasite as the culprit in Montana's Madison River rainbow trout decline 13 years ago. In the mid-1990s, many western state conservation agencies warned that whirling disease could have catastrophic effects on wild rainbow trout populations. And indeed that has been the case in some waters of some states, notably Colorado, where severe infestations have hit most major river drainages and wild trout in many popular streams have been nearly wiped out. In Montana, the waterborne parasite has spread to at least 150 rivers, including the world-class upper Missouri, Gallatin, and upper Bitterroot. And it is considered a dire threat to isolated populations of westslope and Yellowstone cutthroat trout.

Yet whirling disease has not damaged Montana trout populations as badly as some media reports had predicted. The Madison River, once the disease's poster child, has made a remarkable recovery over the past decade after losing most of its rainbow trout to the disease. Trout 12 inches and longer have numbered roughly 530 per mile in recent years. Though less than half that of pre-epidemic levels, the population of catchable trout is still more than four times what it was in 1995, a rebound that has helped make the storied blue-ribbon river Montana's most popular fishing water.

M. cerebralis spore

The upper Missouri River also has fisheries experts scratching their heads. The extraordinary rainbow trout fishery below Holter Dam continues to hold its own, despite severe whirling disease levels in its

SENDING MIXED SIGNALS A rainbow trout looks for aquatic insects beneath the surface of the storied Madison River, once the nation's poster child for whirling disease. In recent years, the Madison's rainbow population has rebounded, and now the river is the most heavily fished water in the state. However, rainbow numbers are still less than half what they were before whirling disease struck in the mid-1990s, providing a murky picture of what biologists and anglers can expect in the future on this and other infested waters.

two main spawning tributaries.

These and other developments may cause trout anglers to wonder if whirling disease is really a problem. The answer is yes, though not one as severe (so far) as some had feared. State fisheries officials note that even though many initial predictions haven't come to pass, the disease-causing parasite is firmly entrenched in an increasing number of Montana rivers, and some waters will likely see temporary or even permanent rainbow trout population declines.

"As we learn more about whirling disease, we're realizing it isn't the end of life as we know it," says Chris Hunter, fisheries chief for Montana Fish, Wildlife & Parks. "But we also know the disease can do some real damage and can't be taken lightly."

Hunter is especially concerned about threats to small, isolated populations of increasingly rare westslope and Yellowstone cutthroat trout. "With large trout populations like those in the Missouri River, you have more genetic diversity to help withstand the effects of disease," he says. "But whirling disease could easily wipe out a small population of native cutthroats living in a remote mountain stream."

JULIE ANDERSON

Hungry sporoplasm

Whirling disease originates in a foreign, microscopic parasite called *Myxobolus cerebralis* that can persist for years in trout streams in a dormant form known as a spore. After being eaten by native underwater tubifex worms, the spores turn into what are called triactinomyxons, or TAMs. When excreted by the worms, these buoyant forms of the parasite float downstream in the current and attach themselves to trout, injecting yet another version of themselves called sporoplasm. The hungry sporoplasm travel along the fish's nervous system to large areas of cartilage in the head and spine on which they feed. Because cartilage in young trout is still forming and soft, it's easy for the sporoplasm to damage the tissue and cause severe levels of disease. The "whirling" refers to a fish's inability to swim straight due to nerve and spinal column damage.

Dick Vincent knows better than anyone the harm that whirling disease can do to trout and trout populations. The FWP senior fisheries research biologist has devoted his 40-plus-year career to studying the Madison River trout fishery and has been conducting nationally known whirling disease research on the Madison since the early 1990s. In recent years, Vincent and other whirling disease researchers have focused much of their attention on what happens to fish that become infected with the disease. In several dozen infected streams, Montana biologists place young trout in "sentinel" cages for ten days to expose the fish to the *M. cerebralis* parasite. They take the fish to an aquarium lab for an additional 80 days, then kill the fish and send the heads to a pathology laboratory at Washington State University, where scientists look for indications of cranial cartilage damage. "In young fish, the disease can actually turn the head to mush," says Vincent.

"As we learn more about whirling disease, we realize it isn't the end of life as we know it."

Sometimes, however, there is no damage, which is what Vincent recently discovered on the Madison. He says the surviving rainbow trout have become genetically resistant to the parasite that still infests the river. In 1999, every rainbow trout that Vincent exposed to TAMs showed severe disease levels. But when he repeated the experiment five years later, fewer than half the fish showed severe disease, and 30 percent had little to none. "As far as we know, this is the only place in the country where rainbow trout have become resistant to the disease," says Vincent. (Brown trout are native to Europe, where whirling disease originated, and are much more resistant. The number of browns on the Madison has stayed constant over the past decade.)

Vincent explains that even though the initial whirling disease outbreak killed up to 90 percent of young rainbow trout between 1991 and 1997, enough survived to keep the population afloat. "Those survivors appear to have significant genetic resistance to whirling disease," he says. "And now they've been reproducing and passing the resistance to new generations of rainbows in the Madison."

According to Vincent, the findings have surprised genetic scientists, who just a few years ago believed that genetic adaptation could not happen in such a short time. "Their theory was that it would take hundreds of years or even longer, because the assumption was that there was no inherent resistance," Vincent says. "But obviously there was some, which is why the genetic adaptation could occur so quickly."

Vincent, who grew up fishing the Madison and knows the river intimately, says he's pleased the famous trout fishery has shown some recovery. "This is good news, because the way things looked back in the mid-1990s, we thought the river was in real trouble," he says.

Nevertheless, the veteran research scientist

Brian Maffly is a freelance writer in Bozeman. Tom Dickson is editor of Montana Outdoors.

STILL A MYSTERY Though the Missouri River's main spawning tributaries are infected with whirling disease, the river's trout population has remained strong. Biologists are still not sure why.

JEFF ERICKSON

still has concerns. The Madison's rainbow trout population has not fully recovered, and the population may never reach pre–whirling disease levels. "There aren't as many adult fish as we'd expect to see in a recovering population, and it appears that growth rates are down," says Vincent.

The inexplicable Missouri

The Missouri River between Holter Dam and Cascade, one of Montana's top rainbow trout fisheries, is another puzzle. In 1998 biologists found severe levels of whirling disease in Little Prickly Pear Creek, one of the river's major rainbow trout spawning tributaries. Three years later, they discovered the disease-causing parasite in the Dearborn River, an even larger tributary; in 2004, they recorded major disease levels there. Inexplicably, however, rainbow trout populations on the Missouri have remained among the strongest in the state, today numbering over 2,500 per mile in the popular Craig section.

Travis Horton, an FWP fisheries biologist who has monitored the Missouri for years, says rainbow "recruitment"—the number of young fish added to the overall trout population each year—is down 33 percent from pre–whirling disease years. "Some of that decline is likely due to the drought in recent years, but there have been a few years of decent water since 1998, so some is no doubt also due to whirling disease."

Yet Horton says the one-third recruitment reduction has not translated into a similar decline in adult rainbow numbers. In fact, numbers have increased. Before whirling disease struck, the upper Missouri around Craig averaged about 500 trophy trout per mile. In the past two years, the number has been roughly 1,500. "The average number of mid-sized adult rainbows (14 to 17 inches) is right at the pre–whirling disease average," Horton says. "But the average number of trophy rainbows (over 17 inches) is well above what we saw in the years before whirling disease."

The findings are baffling. "Our best explanation is that anglers were killing far more large rainbows before 1998 than we thought," he says. "It could be that more trophy trout are now being returned to the water than before."

The Missouri has seen a recruitment decline farther downstream in the Pelican Point section near Cascade. Sixty percent of those trout come from the heavily infected Dearborn River. But 30 percent of the Pelican Point trout come from Sheep Creek, which so far has remained free of the disease. "It looks like recruitment in the Pelican Point section is about 80 percent of average over the past two years," Horton says. "We thought it would be worse, so this is encouraging. It could be that Sheep Creek, which is still clean, mitigates some of the effects from the Dearborn."

Vincent also is puzzled by the Missouri. "The life cycle of the *M. cerebralis* parasite is extremely complicated," he says. "Conditions have to be just right for the disease to take hold. The window of disease development is narrow—only when fish are about 1 to 2 inches long. After that, they are safe from the disease."

Other factors affect the incidence of infection in Missouri River trout, such as water flows, water temperature, fish density, time of fry emergence, and TAM infestation rates when young fish are developing. "We're learning a lot," says Vincent, "but we've got a ways to go before we understand what's happening on the Missouri."

Brook trout not immune after all

Vincent and fellow scientists have also been monitoring whirling disease on more than 30 other Montana streams. Recently, Montana researchers found whirling disease in brook trout, a species long thought to be immune. For years, scientists had wondered why brook trout living in infected waters did not become sick. It turns out that brookies, a non-native species, aren't immune at all; most avoid infestation

ERIC ENGBRETSON 2007

ANOTHER REASON WILD TROUT MATTER Senior fisheries scientist Dick Vincent says Montana trout populations are fortunate the state stopped stocking rivers more than 30 years ago: "That led to the establishment of genetically diverse wild trout populations better able to adjust to changes such as whirling disease. And it switched our focus to habitat protection, which is critical for maintaining healthy wild trout populations.

because they spawn in the fall. The fry emerge from eggs in February, when many streams are still too cold for the infected tubifex worms to release their lethal bounty of TAMs. Rainbows, on the other hand, spawn in the spring. Their fry hatch in early summer, when most streams have warmed to the 45- to 55-degree temperatures that trigger TAM dispersal.

Where researchers recently discovered infected brook trout was in spring creeks. These groundwater-fed streams stay at roughly 45 to 50 degrees throughout the year, meaning that TAM plumes are released throughout the winter—including in February when the brook trout eggs hatch. "This is a problem for brook trout in spring creeks, but it's good news for rainbows and cutthroats [in those waters]," says Vincent. "Spring creeks have pretty much exhausted their TAM output for the year by the time the eggs of cutthroats and rainbows hatch and the fry emerge in early summer."

Another recent finding is that North American trout may have some inherent resistance to whirling disease. Vincent learned this from a serendipitous discovery of resistance in a specific strain of rainbows. In the late 1800s, rainbow trout from somewhere in California were transplanted in waters throughout the interior West to establish sport fisheries. Now called the DeSmet strain, the rainbow trout were planted in Wyoming's DeSmet Lake and later stocked in some Utah and Montana waters, including Harrison Lake (also known as Willow Creek Reservoir), an impoundment of Willow Creek roughly 40 miles east of Butte.

"It's a case of all the eggs being in one basket, and when the basket gets hit by something like whirling disease, the whole thing is wiped out."

Willow Creek has severe levels of whirling disease. Yet recently, when Vincent conducted experiments on progeny of Harrison Lake rainbows at FWP's aquarium at Pony, he found that half of those fish did not become diseased, even though the rest were wiped out.

"We still don't know much about rainbow genetics, but one well-documented theory is that these DeSmet-Harrison fish do have some genetic resistance to the disease," he says. "Unfortunately, we don't know where on the West Coast these rainbows originally came from more than a century ago. If we did, we could go there and study them and learn why they have this resistance, because they developed it long before whirling disease ever got to North America."

Wild and diverse

Despite these recent discoveries, Vincent isn't banking on a resistance gene to keep rainbow trout safe from whirling disease. But he is counting on the inherent genetic strength of wild trout to prevent the disease from ravaging rainbow populations.

"I think there's no question that our wild trout are key," Vincent says, noting that Montana has not stocked hatchery trout in its rivers and streams for more than 30 years. "In populations you need diversity so that fish can respond to changing conditions, so that no matter what gets thrown at the population, there are some members that can survive and keep the population going. Stocked trout don't have the genetic variability to survive those changes."

Spawning habitat diversity is also crucial, he adds. "Rainbow trout in rivers that have many spawning tributaries seem to withstand whirling disease better than those where spawning occurs only in the river mainstem," says Vincent. "When the parasite emerges in spring in a river, it spreads throughout the mainstem at one time, and if all the small fish are in the mainstem, they can get hammered. But if you also have spawning occurring in various tributaries, where there's a greater diversity of water tempetature and the parasites emerge at different times, then there's a greater chance that at least some of these areas will not get hit with the disease, and then you can have at least some natural reproduction. That could be what's happening on the Missouri with Sheep Creek."

Vincent believes that Colorado's vulnerability to whirling disease is due in large part to the state's lack of river spawning diversity. "Almost all the spawning in their main trout rivers takes place in the mainstem," he says. "It's a case of all the eggs being in one basket, and when the basket gets hit by something like whirling disease, the whole thing is wiped out."

Vincent says that when FWP discontinued stocking trout, it changed its focus to habitat conservation. "We've spent a lot of time and money protecting and improving stream habitat, including spawning tributaries and mainstem spawning sites," he says. "We probably wouldn't have done that if we were still stocking fish in our major rivers."

The research scientist adds that keeping tributaries clean will be critical if Montana hopes to keep whirling disease under control. "If Montanans can reduce sewage, agricultural runoff, and bank erosion on spawning streams, then we can reduce the silt and organic matter that foster tubifex worm productivity," Vincent says.

Another way to reduce the spread of whirling disease, says Eileen Ryce, FWP's Aquatic Nuisance Species Program coordinator, is for anglers to keep their fishing boats and gear clean. Ryce urges anglers to remove mud from their boat hulls and wading boots, especially after fishing the Madison, Missouri, and other infected rivers. "We know we can't stop 100 percent of the spread, but we can reduce the problem," she says.

Bob Wiltshire agrees. The president of the Federation of Fly Fishers points out that by keeping boats and fishing gear clean, anglers can also reduce the spread of other waterborne threats. "Whirling disease is part of a larger problem, which is invasive species in general," says Wiltshire. "All aquatic invasives—New Zealand mud snails, zebra mussels, whirling disease—are threats to Montana's fisheries, and we need a concerted effort to keep our rivers free of those threats."

Despite the best efforts of anglers to keep Montana waters clean, it's likely new infestations will continue (though more slowly than if no preventive measures were taken). Scientists continue to study whirling disease and learn how to slow the inevitable spread. But it may be Montana's genetically fit wild trout themselves, along with diverse and healthy spawning habitat, that provide the best line of defense against this and other biological threats to the state's cherished blue ribbon trout fisheries.

For more information on whirling disease, visit the Bozeman-based Whirling Disease Foundation at whirling-disease.org or Montana State University's Whirling Disease Initiative at whirlingdisease.montana.edu.

A whirling disease researcher at Montana State University sorts tubifex worm samples on the Madison River.

WHIRLING DISEASE

How the disease kills trout

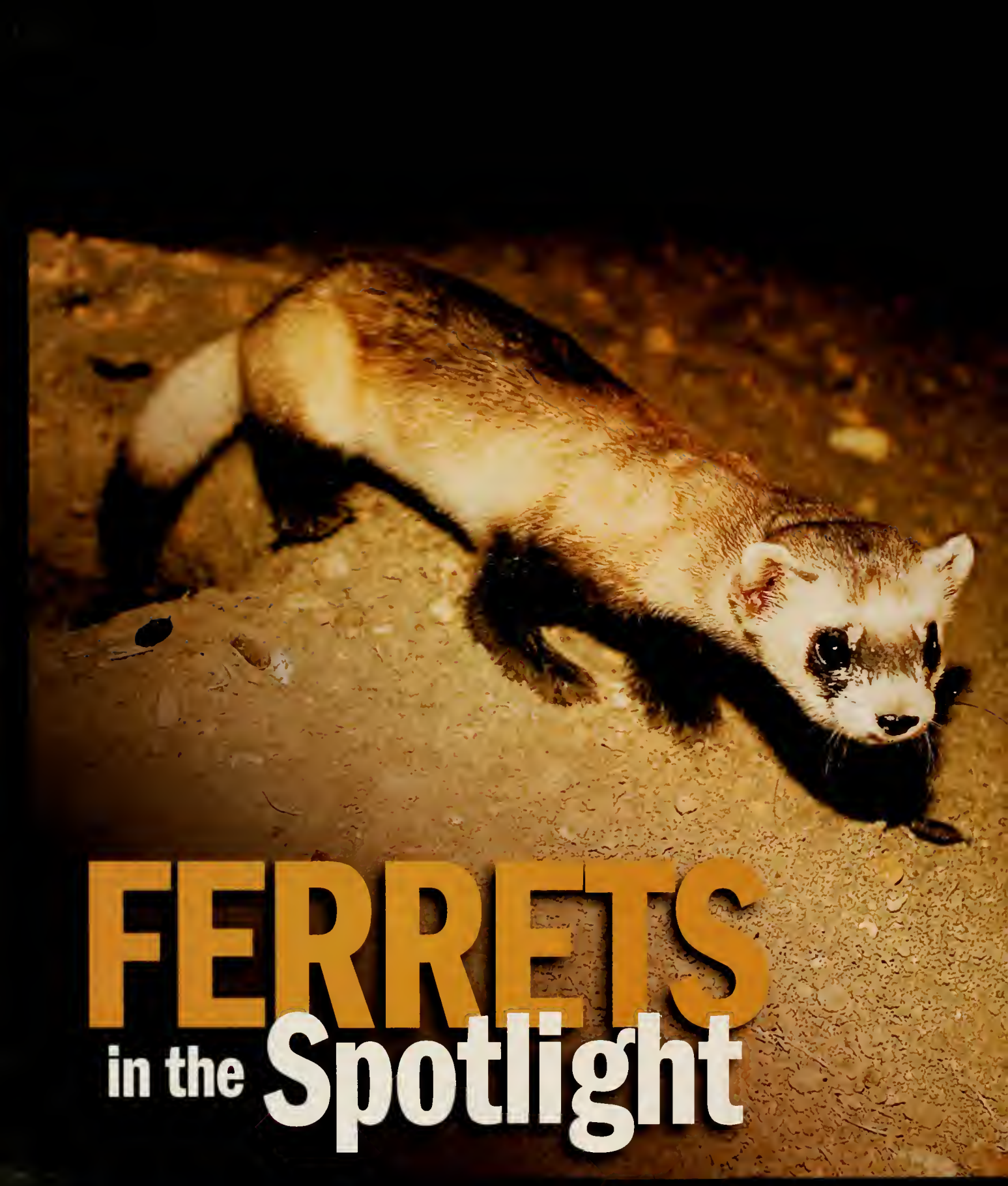
Whirling disease is caused by an exotic parasite that originated in Europe. *M. cerebralis* is a two-host parasite that first began damaging rainbow trout populations in the decades following its introduction into the United States in the 1950s. The parasite's spores can lurk for years on river bottoms, where they are ingested by native tubifex worms, which prefer organically enriched environments containing abundant fine sediments. Inside the worms' digestive tracts, the spores take on a new form: triactinomyxons (TAMs). These spindly creatures are equipped with three long arms that make them buoyant and easily dispersed in the water column. TAMs emerge from the worms in search of a host. They latch onto a trout and inject the disease-causing sporoplasm into the fish.

A trout's susceptibility to the disease diminishes as its bones age and harden. Its first nine weeks of life are particularly perilous. A young trout's bones are still primarily made of soft cartilage, and its immune system is not fully developed. The parasite eats the cartilage in the head, neck, and back, resulting in deformities that can hamper a young trout's ability to swim straight and compete with other fish. Whirling disease doesn't necessarily cause death, but severely diseased fish have a harder time competing for food and space. If it dies, a diseased fish decomposes and releases fresh *M. cerebralis* spores into the stream, continuing the cycle.

M. cerebralis TAM

The "whirling" refers to the circular swimming route made by some severely infected trout. Not all diseased fish show signs of whirling, however. And not all streams infected with the *M. cerebralis* parasite have rainbow trout population reductions.

Unlike imported brown trout, which co-evolved with the parasite in Europe, North American salmonids had never been exposed to *M. cerebralis* before its introduction here. As a result, the salmonids on this continent have little genetic resistance to the disease. Species most at risk are rainbow, cutthroat, bull, and redband trout, as well as mountain whitefish and sockeye salmon.



FERRETS in the Spotlight

Searching eastern Montana for North America's rarest mammal

BY SAM CURTIS

Valerie Kopcso turns the handle of the roof-mounted spotlight. It squeaks. "That's going to drive me crazy," she says.

The Bureau of Land Management (BLM) wildlife biologist pops the hood of the pickup, yanks the dipstick, climbs on the roof, smears oil on the spotlight shaft, hops back in the driver's seat, and twists the handle again. No squeak.

"Good," she smiles. "We'll be using that light all night long."

I've just driven 300 miles to meet her on an April night in this wind-swept expanse of shortgrass prairie, about 50 miles south of Malta just north of the UL Bend National Wildlife Refuge on the Missouri River. We'll be bouncing around a 380-acre prairie dog town until 6 a.m., spotlighting for the bright green eye shine of black-footed ferrets, which will indicate that some of them have made it through the winter. A few years ago, only eight ferrets lived on what the BLM calls its 40-Complex, a 1,200-acre tract encompassing several prairie dog towns. (Ferrets feed on prairie dogs and live in the rodents' burrows.)

"Two a.m. is the ferret witching hour," Kopcso tells me. "They're usually most active about then."

My watch says 9 p.m. I shine my hand-held spotlight into the black night and wonder what we'll see over the next five hours.

ALMOST DISAPPEARED

Black-footed ferrets once likely numbered in the millions across much of the Great Plains. Then, in the first half of the 20th century, a federal prairie dog eradication program eliminated most of the predator's food supply. Black-footed ferrets are now one of the rarest animals in North America and were actually declared extinct in the United States in 1979. But in 1981, a ranch dog killed a lone black-footed ferret near Meeteetse, Wyoming. That amazing retrieve—the equivalent of a Lab returning from the woods with an ivory-billed woodpecker in its mouth—sent researchers racing for the central Wyoming ranch. By 1984, biologists estimated the area contained roughly 130 ferrets, and the U.S. Fish and Wildlife Service (USFWS), Wyoming Game and Fish Department, and other agencies had begun intensively studying the population.

"We spent several years just trying to figure out more about ferrets—how they behave, what their activity patterns were," says Dean Biggins, a research wildlife biologist with the U.S. Geological Survey (USGS). "Then we went through a disastrous time from 1985 to 1987 when plague and distemper hit the colony. We were rapidly transformed from studying ferret ecology to just trying to rescue the few animals that remained."

Black-footed ferrets, one of the rarest animals in North America, were actually declared extinct in 1979

Biggins joined a team of biologists working with the stare of Wyoming to capture the last 18 black-footed ferrets known to exist in the world. They set up a captive breeding program, and by 1991 the first captive-bred ferrets were reintroduced in the wild at Shirley Basin, Wyoming. In 1994, biologists released pen-reared ferrets in Montana on the UL Bend National Wildlife Refuge. They released more in 1997 on the Fort Belknap Indian Reservation and in 2001 on the BLM land that Kopcso and I have been bumping across for hours.

By 1 a.m., I'm eating chocolate-covered coffee beans to stay awake. We've seen two sleeping cows, three mice scampering into prairie dog burrows, and eight antelope with just enough green in their eye shine to momentarily quicken our pulses. But no ferrets.

NOT A GOOD CROP Since 1991, a captive breeding program based in Wyoming has reared black-footed ferrets for release into the wild. The animals are held in cages, vaccinated for distemper, then released in areas of the Great Plains containing large prairie dog populations. So far, survival has been poor. Of the 400 captive-reared ferrets released in Montana and the 300-plus kits they've reared in the wild, only 15 or 16 remain.

"When we do see one," Kopcso tells me, "we need to pinpoint which prairie dog burrow it's using. Each of these ferrets has a microchip implanted under the skin in its neck. We'll put a transponder ring over a hole, and when the ferret comes up to see if we've left, the ring will read the code on the chip. It's like a grocery store checkout, allowing us to identify who's who. The chip also lets us track each individual's movements and family history."

CONSTANTLY SEARCHING

Researchers conduct ferret surveys four times a year. The one we're doing now tells them how many ferrets survived the winter and will be entering the breeding season. In August, they count the number of kits that are born. By September, the kits are old enough for the researchers to catch, anesthetize, inject with microchips, vaccinate for canine distemper, and blood test for genetics and disease. A fourth survey in December, 30 days after any new ferrets are released, counts how many survive their first month in the wild.

I eat an apple and continue to peer into the night, fanning my spotlight over the prairie dog mounds. A ferret is a specialist at maneuvering through these labyrinthine tunnels at night to awaken sleeping prairie dogs and grab them by the throat with a killing bite. "Ferrets are feisty critters, with an 'I'm-going-to-kick-your-butt attitude,'" says Randy Matchett, USFWS wildlife biologist at UL Bend. A ferret is also photogenic, with a lanky, 2-foot-long body that's tawny on the back and creamy underneath, with short, black legs, a black tip to its tail, and a roguish mask across the eyes.

Prairie dogs comprise 90 percent of a ferret's diet. One researcher estimates that a family of four ferrets eats on average 109 prairie dogs a year. Ferrets live and raise their young in prairie dog burrows and spend roughly 80 percent of their lives underground. Without prairie dogs, ferrets cannot survive.

Even in well-established prairie dog towns, however, newly released ferrets had poor survival rates when the reintroduction program first began in the 1990s. Biggins and his associates experimented by preconditioning captive-bred ferrets in walled prairie dog towns. The animals got on-the-job training killing prey and living in burrows before being released into the wild.

THE PLAGUE PROBLEM

That helped, but not much. The road to ferret recovery in the wild remains rocky. In Montana, numbers have dropped to a mere handful. Matchett and other biologists suspect that low levels of plague may be partly to blame. Prairie dogs are host to a wide variety of fleas that can carry sylvatic plague and infect the host. Researchers once thought the primary threat to ferrets came from the disease reducing or eliminating prairie dogs. Now they theorize that some ferrets may be dying directly from plague after eating infected carrion or being bitten by plague-infected fleas. "We're conducting a study in which we apply flea-killing dust to half the prairie dog colonies in our release site," Kopcso tells me. "We'll compare the survival and productivity of ferrets in the dusted areas with the survival of those in areas not dusted."

Matchett says the study is labor intensive. "When we dust an area, we have to apply the [flea-killing] dust down every single burrow," he says. "Last summer, it took a crew of five nearly 300 hours to treat 26,000 burrows on 1,000 acres at UL Bend." Researchers are also field-testing a new vaccine developed at the National Wildlife Health Center in Reston, Virginia, for use against plague in black-footed ferrets. "Vaccinating the ferrets requires catching every animal twice, at least 30 days apart, because we have to administer a booster to provide adequate immunity," Matchett says.

The clock in the pickup reads 3:47 a.m. Through the night, we've occasionally seen the spotlights of three other survey workers cruising prairie dog towns nearby. Kopcso calls each one on the two-way radio. Still no ferrets.

Then she stops the truck and swivels her light to a spot 40 feet beyond the right fender.

"What?" I ask, waking with a start from my half-sleep.

"A mountain plover. See it? It's the first one I've seen this season."

The 7-inch, white and tan bird cocks its head and scampers across the rocks and stubble. A migrant, it has come here to mate. Like burrowing owls, swift foxes, ferruginous hawks, and black-footed ferrets, the plover is

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Sam Curtis of Bozeman is a frequent contributor to Montana Outdoors.

"I'm a wildlife biologist, but I believe strongly that ferret recovery is about more than biology. It's about good working relationships with everyone who has a stake in these animals."

ANDY LONG

a Montana "species of concern" (those at risk due to rarity, restricted distribution, habitat loss, or other factors). And also like those species, its fate is closely tied to the habitat created by prairie dogs.

Montana's two prairie dog species, the white-tailed and black-tailed, are both ferret prey. The black-tailed prairie dog is much more common in Montana, but because its population is now far lower than before European settlement, it too is a state species of concern. Until 2004, it was a candidate for federal listing as a threatened species.

Ferrets depend on prairie dogs, which comprise 90 percent of their diet. Without prairie dogs, there can be no ferrets.

Many Montana ranchers—who often feel like a threatened species themselves—have criticized efforts to protect prairie dogs, which they consider a pest that competes with cattle for grass. Wildlife conservation in eastern Montana depends on the cooperation of landowners on whose property so much wildlife lives. The only way to sustain prairie dogs—and thus ferrets—is to make conservation efforts compatible with local economies and culture. That's why the Montana Black-Footed Ferret Working Group, formed in 1981, includes ranchers along with state and federal biologists, conservationists, and representatives of the Fort Belknap Indian Community, Prairie Ecosystems Action Council, Matador Ranch (owned by The Nature Conservancy), and American Prairie Foundation.

OUNCE OF PREVENTION

Kopcso stops the truck and turns off the spotlight. Dawn is giving definition to the huge expanse of the Great Plains, and our night search is over. "I'm a wildlife biologist," she says, "but I believe strongly that ferret recovery is about more than biology. It's about good working relationships with everyone who has a stake in these animals. One of my primary goals here is to build relationships and trust with these people."

ELIZABETH A. LEWIS

On the long drive home, I think about the enormous amount of time, energy, research, and cooperation required to restore an endangered species—especially one like the black-footed ferret, which now has a nationwide population of fewer than 500 in the wild. It seems to make more sense to work, whenever possible, at preventing species from being pushed to the brink of extinction rather than expending so many resources to pull them back from the brink.

For one thing, it's less expensive. For another, there's no guarantee you can restore an endangered species. After 13 years of ferret recovery work in Montana—where more than 400 captive-reared animals have been released and more than 300 wild-born kits have been observed—only 15 or 16 ferrets now exist in the state. Matchett says a viable population won't survive over the long term without at least 100 breeding females. "It's disappointing," he says. "I have no expectation of establishing a viable ferret population in Montana any time soon, especially with the present limited size of prairie dog complexes and the plague component. The whole issue of ferret recovery has to do with managing prairie dogs—and the two biggest factors affecting prairie dogs are human tolerance and plague."

Despite the setbacks, Matchett remains hopeful that black-footed ferrets and cattle ranching can coexist. "Montanans take pride in their wildlife and natural heritage," he says. "We've found room to accommodate growing populations of wolves and grizzly bears in other parts of the state, and I think we can do the same with black-footed ferrets and prairie dogs in eastern Montana. We just need to figure out how."

EDITOR'S NOTE: *Valerie Kopcso recently left the BLM and is now working for the U.S. Forest Service in South Dakota.*

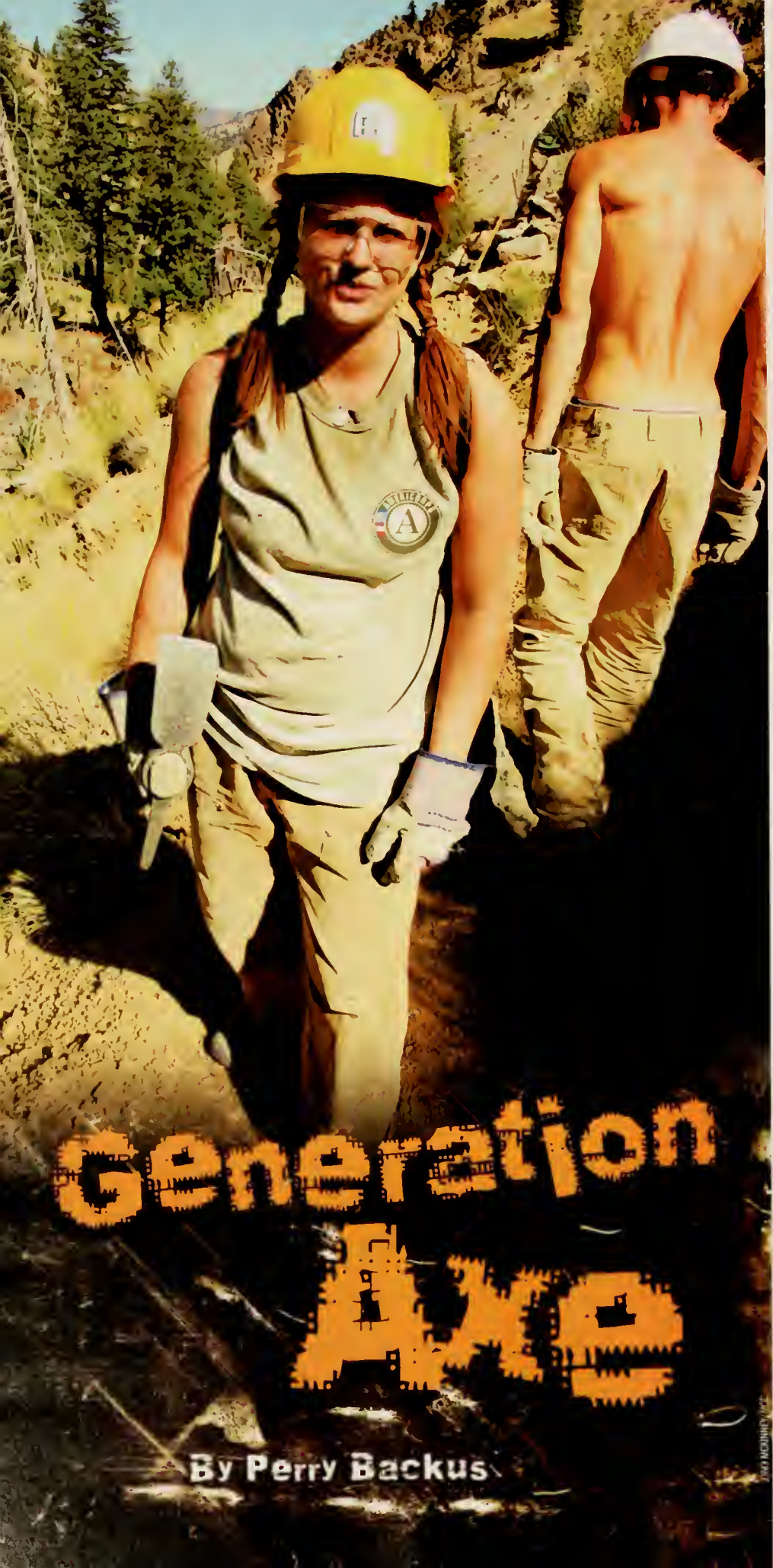
MONTANA RECOVERY EFFORTS

The recovery of federally endangered species is a shared responsibility of the federal government and the states. "Montana actually has a state statute mandating ferret recovery," says Annie Dood, FWP endangered species coordinator. FWP's Northwestern Region Prairie Dog Plan calls for increasing the size of prairie dog complexes and establishing at least one large complex of 5,000-plus acres. Pat Gunderson, the department's regional supervisor in Glasgow, says he hopes to find private landowners willing to work with the department in establishing a big complex. "The Charles M. Russell National Wildlife Refuge and several conservation groups are eager to be a part of it," says Gunderson. "But we need some private land, too, so we're looking at incentives that might get willing landowners involved."

Last year, FWP received federal funds to look for ferrets in southern Phillips County in areas beyond the original 1994 and 2001 release sites. "If we could find ferrets outside the release sites, that would indicate that ferrets are dispersing and reproducing," says Ryan Rauscher, the department's regional Native Wildlife Species Program coordinator in Glasgow.

Rauscher hired a two-person crew in fall 2006 to find active prairie dog colonies and then conduct night surveys for ferrets. Through the survey turned up no ferrets and found that many prairie dog colonies have been wiped out by plague. Rauscher says he hasn't given up hope.

"This is a big state, and a lot of it has yet to be surveyed from the ground," he says. "There could be prairie dog complexes out there large enough to support black-footed ferrets, but we just haven't found them yet."



Generation Axe

By Perry Backus

With Pulaskis in hand, young adults of the Montana Conservation Corps work together to blaze trails, cut brush, and otherwise improve Montana's outdoors.

As the shout "Fire in the hole! Fire in the hole!" rings out, crew leader Bob Ellenbecker and six other Montana Conservation Corps (MCC) crew members make themselves small behind stout trees and huge boulders. *Kerwhomp*! The dynamite blast momentarily shatters the stillness of the serene mountain valley.

As the dust settles, the crew makes sure the explosive has split the huge boulder that had been blocking a trail. Now halfway through their ten-week stint on a remote section of the Cliff Creek Trail in the Selway-Bitterroot Wilderness, the tanned and muscular young men and women know what's next. After pulling on well-worn gloves, they pick up their trusty shovels, spud bars, and Pulaskis (axe-hoe hybrids named after an early 20th-century U.S. Forest Service ranger) and begin another long day of hard physical work.

As the noise of steel striking stone rattles through the trees, Ellenbecker recalls another sound that filtered through camp a few nights earlier, when wolves howled their lonely song into the cold mountain air. "They couldn't have been much more than a quarter-mile away," he says. "Later that day we heard another wolf howl even closer."

GET 'ER DONE Young men and women age 17 to 25 from across the country join Montana Conservation Corps crews to improve the environment, the community, and themselves.

TOM BAUER

ROCK ON Dynamite dislodges the biggest boulders blocking trails, but MCC crews use their backs and spud bars to move the rest.

Tough but rewarding

A nonprofit organization funded with public and donor dollars, the MCC offers a unique combination of grueling labor, intense teamwork, civil service, and the opportunity to spend a summer in some of Montana's wildest and most scenic locales. Crews build and improve trails, manage invasive weeds, put up fencing, and reduce wildfire risks across Montana. Every summer, hundreds of young people from across the country join the MCC for five- to nine-month terms. Some come to test themselves against the wilderness; others want to help the environment; many do it for the several thousand dollars in college tuition they can earn.

Some join not knowing what they are getting into—and end up drawing on inner resources they never knew they possessed. Ellenbecker, who hails from Wisconsin and is a student at the University of Montana, recalls supervising a 20-something woman from New York City. She had no outdoors experience and arrived in Montana with almost no gear. He immediately saw that the urbanite was physically ill-prepared for the rigors to come. "The first time she hiked the 15 miles to our camp at Cliff Creek, she really struggled," Ellenbecker says. "But by the end of the ten weeks we spent there, she was doing it in just three hours. It was something to watch this woman from New York get to where she was knocking down trees 100 feet tall with a crosscut saw."

Putting city folk to work in the backcountry has a long history in Montana. The MCC traces its legacy to President Franklin D. Roosevelt's Civilian Conservation Corps, which provided jobs for young men unable to find employment during the Great Depression (see sidebar on page 34). Its good work from more than half a century ago is still visible today in landmarks—such as Lewis & Clark Caverns (Montana's first state park)—scattered across the state.

> "It was something to watch this woman from New York get to where she was knocking down trees 100 feet tall with a crosscut saw."

After the CCC ended in 1942, the civilian conservation concept wasn't resurrected again in the state until Montana Fish, Wildlife & Parks and the Human Resource Development councils in Billings, Bozeman, and Kalispell teamed up to establish the MCC. The first crews began working in 1991 on projects coordinated by Steve Nelsen, the program's first director. "The MCC really began with little more than a hope and a prayer." says Nelsen. "The first day I arrived at my office all I had was a desk, a phone, and a box of Kleenex."

The program's goal from the outset was to create good citizens through work requiring both sweat and cooperation. "Within these crews people learn how to work with each other," Nelsen says. "It's really democracy at its most basic level. You learn to participate. You learn what it's about to be part of a group working toward a common goal. A young person who spends a year or even a summer being a good citizen will likely become a good citizen for life."

Federal support

The MCC got a big financial boost in 1993 when it became part of the new AmeriCorps system, a domestic version of the Peace Corps. The federal funds more than doubled the organization's budget and allowed it to establish regional offices. The MCC now operates from offices in Billings, Bozeman (headquarters), Great Falls, Helena, Kalispell, and Missoula.

Early on, the MCC began building a reputation for tackling difficult trail restoration jobs. One of those was at Lewis & Clark Caverns State Park. Park managers worried that petroleum products would leach from the old asphalt trail winding through the caverns and damage cave formations. They wanted to remove the old trail (installed a half-century before by the CCC) and build a new one using concrete. It would be hard,

dirty work, so they called on the Montana Conservation Corps.

Lynette Kemp, park manager, says that power equipment can't be used in the caverns, so the MCC crews had to carefully remove nearly a half-mile of asphalt one bucket at a time. "It was back-breaking work," she says of the project, which took place in the early 1990s. "They were on their hands and knees for hours at a time making sure they didn't leave any asphalt behind." When the crews finished carrying out the asphalt, they had to haul concrete and water into the caverns using the same buckets.

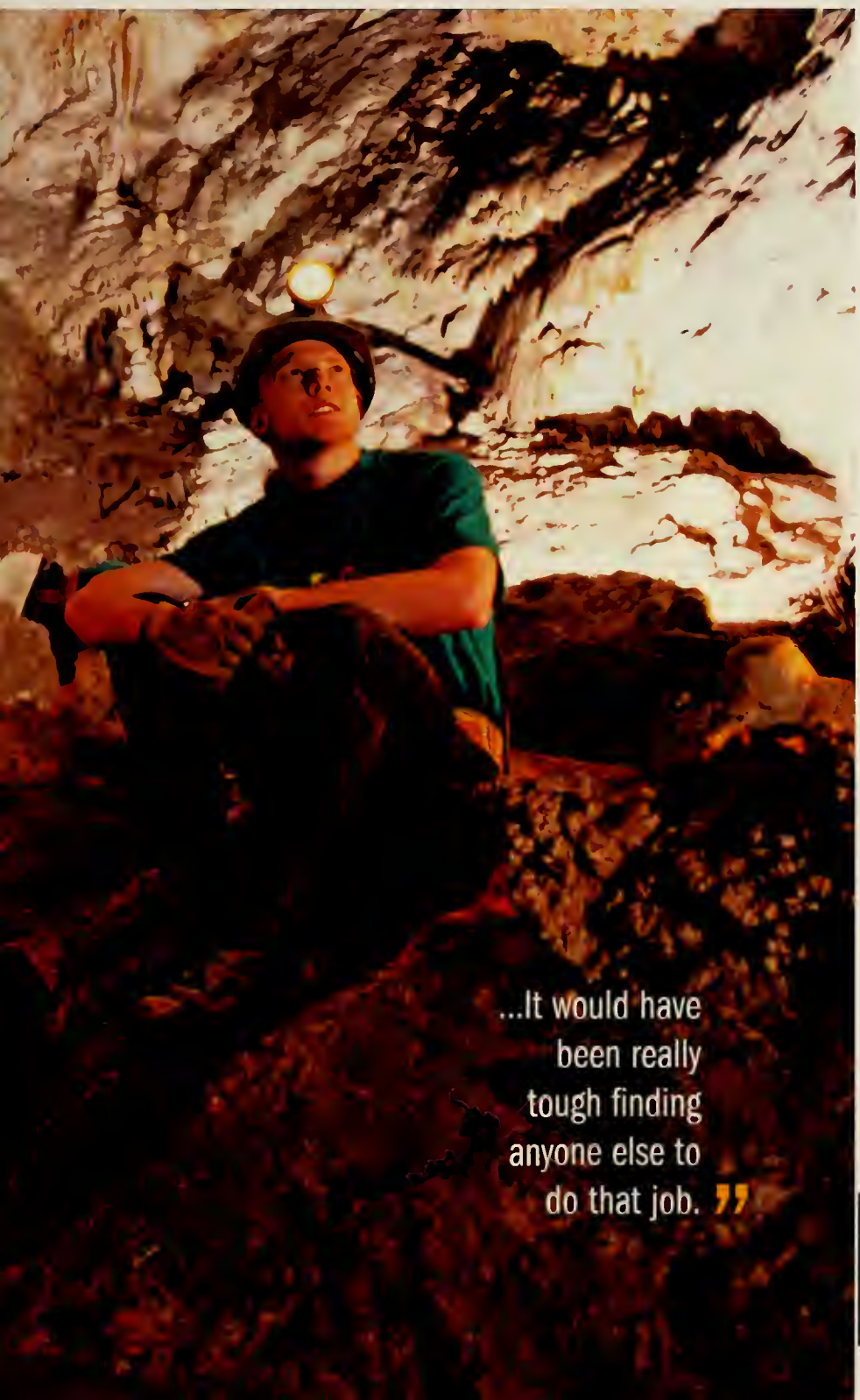
Since then, the MCC has also built cabins and carved out miles of new trails through portions of the park that previously had seen little use. During one winter, when the park was closed, crews carefully cleaned dust and dirt off stalactites and stalagmites. "That was a tedious job," says Kemp. "They had to carry in all the cleaning water, and a lot of times they actually had to use toothbrushes to do the cleaning. It would have been really

"That was a tedious job. They had to carry in all the cleaning water, and a lot of times they actually had to use toothbrushes to do the cleaning....

JAMES WOODCOCK

tough finding anyone else to do that."

It's not just a willingness to do grunt work that makes MCC crews so valuable. At Lone Pine State Park near Kalispell, a popular trail needed to be rerouted after park officials learned it veered onto private property. The new trail had to be built along challenging terrain at the base of a cliff. Park manager Dave Landstrom was confident the MCC crew could figure out a way to make the reroute work. "It's an extremely popular trail, and some of our regular visitors were concerned about it being rerouted and not looking as nice," he says. "The MCC crew we worked with showed a lot of creativity by incorporating rock steps and other nicely crafted features. People were very pleased with the end product."



Building resumes, too

Joining an MCC crew is by no means lucrative; even some fast food chains pay better. But the work has rewards you can't get slinging burritos.

Each MCC crew has two co-leaders and four to five corps members. Crew leaders are typically in their mid-20s and have previous leadership or natural resource experience. During their nine-month stint, the leaders put in 1,700-plus hours, during which they're provided a $545 biweekly living stipend, health insurance, and a one-time $4,725 grant for future schooling or educational loans. They also receive extensive training in technical skills such as chainsaw operation, trail construction, and wilderness first aid. Corps members join for 20 weeks between May and October. Their biweekly stipend is $480, plus a $2,363 educational grant at the end of their service.

Though the money isn't great, the work has many benefits. Crew members commonly talk about feeling stronger at the end of the season. Many leave with a heightened interest in staying involved in their community as volunteers and land stewards. Friendships made during stints in the wilderness often last lifetimes. Landstrom, the state park manager at Kalispell, says that when it comes time to hire park staff, he always looks for MCC experience on resumes. "That kind of experience is hugely valuable for people looking to work in our field," he says. "You can't beat having that on a job application."

Not everyone has what it takes to commit to an MCC stint, says Jono McKinney, MCC's executive director. "People have to be willing to work hard, learn about themselves, and be part of a crew," he says. "They have to be able to live and work together with different people. It can be tough."

MCC members are also expected to attend meetings of the local city council or some

PAVING THE WAY Having removed an old asphalt trail at Lewis & Clark Caverns, an MCC crew lays in a new cement pathway. A few years later, a crew took on the task of cleaning the caverns' famous but dirty stalactites and stalagmites.

other public board. And they're required to volunteer some of their own time to help with any cause that interests them. "We want people to become involved in their community for the rest of their lives," McKinney says.

Miles of trails

During the past field season, MCC crews improved 887 miles of existing trails and built 29 miles of new trails on national forests, state parks, and other public lands. They also removed or built 48 miles of new fence, controlled weeds on 1,171 acres, and reduced fire danger by clearing brush on 171 acres. In addition, they assisted in restoring 12 miles of stream and planted roughly 50,000 trees and shrubs.

MCC crews also helped construct 11 homes, worked on 95 community buildings, and weatherized 1,456 homes in 151 different communities as part of Montana's Warm Hearts, Warm Homes Program.

Chase Jones, who has participated in the MCC for several years, says that he liked the fact that his work combined environmental improvement in wilderness areas with helping people in towns and cities winterize their homes. "Sometimes it's hard to realize your impact when you're in some remote field location," he says. "But when you help people winterize their homes, you really can see firsthand the true value of volunteerism."

LEMANNA RAADT/MCC

FROM TRAILS TO TOWNS In addition to building and improving trails on public land, MCC crews do work such as (from left to right) installing a temporary fish barrier to protect native cutthroat trout from non-native fish on Crooked Creek in the Pryor Mountains; stabilizing a stream bank with willow shoots on Ten Mile Creek near Rimini; weatherstripping a residence in Helena; and building garden beds in Missoula.

In 2002, Jones helped start MCC's MontanaYES (Youth Engaged in Service) Program, which serves local youth age 14 to 17. During the five-week sessions (sort of mini-MCC summer stints) offered in communities across the state, teens do community service and help with natural resource projects. Jones has heard plenty of praise for the program from both participants and their parents. "The kids told me they found it fun to serve other people," he says. "Some said they hadn't known they could do such

Perry Backus is a reporter for the Missoulian.

MCC: the legacy of a great social experiment

NPS.GOV

A CCC poster from 1938.

In 1933, the United States was in the midst of a nationwide crisis.

Two million able-bodied men were out of work. Hunger was widespread. Drought had begun turning the heartland into dust. Newspapers ran photographs of people lined up at soup kitchens, worry etched deeply into their faces.

Such desperate times required desperate remedies. Yet when President Franklin D. Roosevelt announced formation of the Civilian Conservation Corps during his first 100 days in office, he faced doubters from both sides of the political spectrum. Liberals worried it would force wages of union workers down to starvation levels. Conservatives called the proposal fascist and said it would waste public monies.

Congress eventually consented, however, and between 1933 and 1942 (the year the CCC was disbanded) it spent roughly $3 billion on the program. In Montana, more than $42 million was spent on projects many residents and visitors still enjoy. "They left us with an incredible legacy," says Stan Cohen, Missoula author of *The Tree Army: A Pictorial History of the Conservation Corps 1933–1942*. "Projects like Camp Paxson at Seeley Lake and the Ninemile Ranger Station near Missoula are still being used."

Most Civilian Conservation Corps camps were run by the U.S. Army.

physical work. Others were happy to discover they could make a difference in their communities by just getting involved." Parents, he adds, were surprised their kids were willing to take on new responsibilities after returning home. "Their kids actually volunteered to do the dishes," he says.

By becoming involved in the MCC, a teenager who starts doing household chores can soon become a young adult who blazes trails, helps seniors keep warm, and builds stronger local communities. "What we do is show young people how to become good citizens," says McKinney.

Throughout 2007, the Montana Conservation Corps will be offering five-week Youth Engaged in Service Program sessions in different communities across the state. To sign up, apply to be an MCC crew member, or learn more about the organization, visit the MCC website at mtcorps.org.

The work was supervised by federal land management agencies such as the U.S. Forest Service, Bureau of Land Management, and Soil Conservation Service.

During each of the nine years the program lasted, roughly two dozen camps were maintained in Montana. Each camp typically housed about 200 men age 18 to 25. The crews were issued food, clothing, and equipment through the CCC's regional headquarters at Fort Missoula. As in the military, the men worked in teams and weren't allowed to quit before their six-month enlistment ended.

More than 25,000 Montanans joined the program. By the time the CCC ended, they and another 15,000 men from across the country had spent time in the state building trails, planting trees, and constructing buildings—work similar to what MCC crews continue to do today.

"The program helped jump-start the conservation movement in this country," Cohen says. "It put people to work in the woods and built a variety of important pieces of infrastructure that Montanans still enjoy."

Fish Creek Bridge, once located a few miles west of Alberton, was typical of the structures built by the CCC in Montana.

SURVEYOR ON STEROIDS Through the late 18th and early 19th centuries, Canadian explorer and fur trader David Thompson surveyed some of the most inhospitable terrain in North America, covering more than 55,000 miles during 28 years. A writer in *National Geographic* wrote: "He made Lewis and Clark look like tourists."

DAVID THOMPSON TOOLS, MAPS, AND JOURNALS BY TODD GIPSTEIN/NATIONAL GEOGRAPHIC IMAGE COLLECTION

Incredible Journeys

The life and travels of fur trader David Thompson, the first white to explore and map today's northwestern Montana and western Canada, were nothing short of remarkable.

BY DAVE WALTER

Because Meriwether Lewis and William Clark never ventured into today's northwestern Montana, the region received little fanfare during the recent Corps of Discovery festivities. But residents there will soon be celebrating the bicentennial visit of another hero, a contemporary of the American explorers who was equally important to the opening of western North America and arguably even more resourceful and accomplished. Canadian David Thompson, a little-known explorer, surveyor, cartographer, and naturalist, accomplished for Canada what the Lewis and Clark Expedition did in this country. And he did it on his own.

Starting as a teenager, Thompson worked for nearly three decades as a trader and surveyor for Canada's two preeminent fur companies: the Hudson's Bay Company from 1784 to 1797 and the North West Company from 1797 until his retirement in 1812. He explored, surveyed, and mapped much of the Canadian plains, the Canadian West, and what was called the American "Inland Empire" (eastern Washington, northern Idaho, and western Montana). He covered an estimated 55,000 miles in a lifetime of travels and, most important, left a detailed record of his many years of field work. Though he rose to prominence in the fur trade and discovered new lands, rivers, and trade roures never before mapped, Thompson died impoverished and virtually unknown. His story is borh heroic and heartbreaking.

Educated in Virtue and Piety

Thompson was born to Welsh parents in London, England, in 1770. His father died two years later, leaving the family destitute. In 1777, when she no longer could support all of her children, Thompson's mother sent him to the Grey Coat School in Westminster, a charitable church institution that raised and educated poor children. The school shaped young Thompson's character and formed the

LUKE DURAN/MONTANA OUTDOORS

INTREPID EXPLORER After being sent by his widowed mother to a church school as a young boy, Thompson began his apprenticeship with the Hudson's Bay Company at age 14. A few years later, while still a teenager, he began exploring the continent. During the next 28 years, he traveled from the Saint Lawrence River to the Pacific Ocean and northern Saskatchewan. In 1808 he made the first of several visits to today's northwestern Montana.

basis of his sober, Christian adult life.

At school, young Thompson learned mathematics, navigation, surveying, geography, and penmanship. A sharp student, by age 14 he was detailed to the Hudson's Bay Company (HBC) to serve a seven-year apprenticeship. The fur conglomerate immediately put him on a company vessel to Churchill Factory, the firm's northernmost trading post on the western shore of Canada's Hudson Bay.

As a clerk at Churchill Factory, Thompson learned the rudiments of fur-trade marketing. What really captivated him, however, was the surrounding Canadian wilderness and its native inhabitants. The next year Thompson moved to York Factory, 150 miles south along the shore of Hudson Bay, where he served as both a clerk and a hunter, supplying the outpost with meat.

At age 16, Thompson was outfitted with a handkerchief, shoes, shirts, a gun, powder, and a tin cup and sent inland into the Saskatchewan drainage with a brigade of trappers. For the next several years, the teenager traded with the local Indians for furs.

During the winter, Thompson lived with a band of Piegans (members of the Blackfeet Nation) near the current site of Calgary, Alberta. While trying to persuade his hosts to trade furs for goods with the Hudson's Bay Company (rather than with the North West Company), Thompson learned much about native customs and character—information he used successfully for the rest of his trading career.

A turning point in Thompson's life came in 1788 when he fell down a steep creek bank and shattered his leg (for the rest of his life he walked with a slight limp). He spent the next year recovering at Cumberland House, a trading post. There he met Philip Turnor, the HBC's top surveyor, who taught Thompson how to take latitudinal and longitudinal readings using a sextant, compass, telescope, and watch.

Thompson's apprenticeship with the Hudson's Bay Company ended in 1791, when he signed a three-year contract with the firm. Although his primary responsibility was trading furs, his passions were for exploring and surveying. That didn't sit well with his superiors, however, who considered surveying a distraction from Thompson's fur-trading duties and forbade him from further exploring. When his second three-year contract with the HBC ended in 1797, Thompson quit and signed on with the Montreal-based North West Company, chief rival of his previous employer.

North West Company officials appreciated Thompson's surveying skills. They directed him to pinpoint the location of company trading posts along the 49th parallel, find the source of the Mississippi River, and visit the Mandan villages on the upper Missouri River. For the next 15 years, Thompson followed well-defined Indian trails to explore and map previously undocumented territory from Lake of the Woods to the mouth of the Columbia River and from northwestern Montana to northern Saskatchewan.

Several "worst" days

Thompson endured amazing hardship. On one midwinter overland trip in 1797 to what is now central North Dakota, he often recorded temperatures near 40 below zero. He called three separate days during this trip "the worst day I ever saw in my Life," due

He Who Looks at the Sheep?

Named for the name the Salish Indians gave to David Thompson, the KooKooSint Sheep Viewing Area is located roughly 10 miles east of Thompson Falls. The highway pull-off provides visitors with a view of KooKooSint Ridge to the north, as well as close views of bighorn sheep in spring and late fall.

The late Dave Walter was an author, lecturer, and Montana Historical Society research historian. A version of this article originally appeared in Montana Magazine *in 2004.*

ARCHIVES OF ONTARIO, I 1614) F 443-6 DAVID THOMPSON FONDS

60 SQUARE FEET After retiring, Thompson spent three years working on a map of the North American West. From his field journals and partial maps, he crafted an amazingly accurate chart of travel routes and trading posts. The finished map (above) was more than 10 feet long by 6 feet high and depicted nearly 2.5 million square miles of land. Upon completion in 1814, it was hung in the board room of the North West Company at Fort Williams.

TRUE LIKENESS? No confirmed image of David Thompson survives. Canadian artist Alice Saltiel-Marshall recently painted the portrait at left using written descriptions of Thompson such as this one: "His figure was short and compact, and his black hair was worn long all round, and cut square, as if by one stroke of the shears, just above his eyebrows. His complexion was of the gardener's ruddy brown, while the expression of his deeply-furrowed features was friendly and intelligent, but his cut-short nose gave him an odd look."

both to the cold and lack of food. On January 22, he was reduced to eating "the Marrow Bone of a Buffaloe which had been pretty well Knawed by a Wolf."

The explorer was known for his indomitable will, strict self-discipline, and tremendous physical energy. Whether on foot, in a canoe, behind a dog sled, or on horseback, the man was a dynamo who would forge on in the most severe blizzards or sweltering summer temperatures. Despite developing blindness in one eye, he kept explicit journals, making daily entries on location, topography, native customs, wildlife, and flora. He was also deeply religious. His journals are replete with such phrases as "May Kind Heaven send me Peace, Health & Plenty in my new dwelling" and "Pray good Providence to keep us well."

Thompson treated native people with respect and honesty. He refused to use alcohol as a trade item because he'd seen the harm it could do to native trappers and their families. Though a devout Christian, he respected the Indian's spiritual beliefs. "The Cree believe that the earth is also a divinity, and is alive," he wrote. "The forests, the ledges and hills of rock, the lakes and rivers have all something of the manito [spirit] about them."

Many Indians considered him a friend, and some bands believed he held supernatural powers because he was constantly looking up to the heavens (standard procedure for a surveyor). The Salish called him *Koo-Koo-Sint*—"He Who Looks at the Stars." His fellow traders considered him an expert on Indian customs and culture.

In 1799 the 29-year-old Thompson married Charlotte Small, a 13-year-old Métis daughter of a Cree woman and Scottish fur trader. Unlike most other fur traders, Thompson remained devoted to his young wife throughout his life. She helped him understand various Indian dialects and bore him 13 children, the first five of whom were born at various fur-trading posts in the Canadian West. Whenever possible, Thompson's entire family traveled with him on his arduous surveying and trading trips.

Thompson became a partner in the North West Company in 1806. The following year, accompanied by his family and a crew, he crossed the Rocky Mountains for the first time and descended to the Columbia River. The party reached Windermere Lake in July. Nearby, Thompson built the Kootanae House trading post, giving his company a firm hold on the upper Columbia River fur trade.

Down into Montana

In spring 1808, Thompson and his men descended the Kootenai River into what is now Montana and Idaho. As on all his trading expeditions, he also surveyed the route. The following year on Idaho's Lake Pend d'Oreille, Thompson began building Kullyspel House—the first trading post west of the Rocky Mountains in the United States. In November, he ascended the Clark Fork River and, near today's Thompson Falls, built Saleesh House—the first Montana trading post west of the Rockies.

Over the next few years, Thompson and his family spent several months at Saleesh House. One winter he ascended the Clark Fork and on horseback reached the site where Missoula now sits. Here he climbed Mount Jumbo, from which he sketched the countryside. His journal entry for February 26, 1812 notes: "*A rainy Night, fine Morng—at 5-½ AM set off, came into fine Plains & Hills—went up a high Knowl, from whence I had a fine Prospect of the Country....bad Weather gathering prevented me from going farther & the Country is rapidly thawing, the Horses sink deep every step & fatigue much.*"

When Thompson ended his trading and surveying career in 1812, he had spent 28 years exploring central and western Canada and the northwestern United States. He was awarded his full share of company profits for three years, during which time he was to produce a single map of the region he had surveyed during his career. The final map he drew for the North West Company covered an area of nearly 2.5 million square miles and meas-

ured more than 6 feet tall and 10 feet long.

After severing ties with the North West Company, he worked for the British Boundary Commission surveying the U.S.–Canada border. Though he retired relatively wealthy, he invested poorly and made large loans that were never repaid. He and Charlotte moved to Longueuil, near Montreal, to live first with a son and then with a daughter. Although he continued to occasionally work as a surveyor, he finally was forced to pawn his surveying equipment and even his overcoat to buy food for his family.

During his last years, Thompson worked on a personal account of his travels that he called the Narrative, based on his 77 field journals. The Narrative made for compelling travel literature, conveying Thompson's keen observations, strict regard for the truth, and a complete absence of egotism. Unfortunately Thompson could not find anyone to publish his work. To make matters worse, he became blind in his second eye.

Thompson died in poverty, obscurity, and darkness on February 10, 1857, at the age of 86. His wife survived him by only three months, and both were buried in Mount Royal Cemetery in Montreal. No headstone marked either grave.

Thompson was an explorer of the highest rank. He produced the first reliable map of the Canadian West, he located the U.S.–Canada border in many places, he plotted the full course of the Columbia River, and he made some of the first written observations of the region's native people.

Nevertheless, those unparalleled achievements might still be unrecognized were it not for Dr. Joseph B. Tyrrell, a Canadian geologist. He unearthed the Thompson journals and papers and saw to their publication in 1916, which then led to Thompson memorials at Lake Windermere (Kootanae House), Lake Pend d'Oreille (Kullyspel House), and Thompson Falls (Saleesh House). (Montana has also named the Thompson River, Thompson Prairie, and Thompson Lakes in the explorer's honor.) In 1927, Tyrrell placed a headstone topped with a sextant at Thompson's gravesite. It was a long overdue tribute to a man many now consider the world's greatest land geographer.

This year is the bicentennial of Thompson's first trip across the Rocky Mountains and the 150th anniversary of his death. Commemorative events will continue through 2012. Go to davidthompson200.ca for more information. For original transcripts by David Thompson, look for his Travels in Western North America, 1784–1812, *published in 1971 by Macmillan Company of Canada, and* David Thompson's Narrative of his Explorations in Western America, 1784–1812, *published originally by the Champlain Society and reprinted in 1968 by Greenwood Press of New York.*

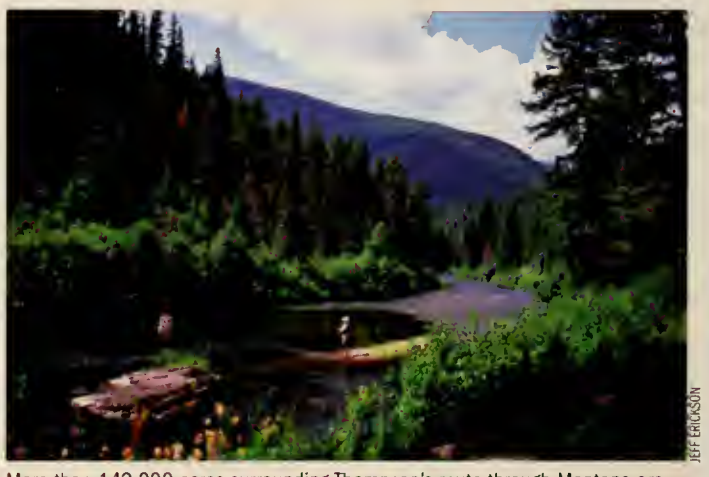
Helena Conference to Feature Thompson and Fur Trade

On June 15-16, the Montana Historical Society (MHS) is sponsoring a two-day teachers' conference on David Thompson and the North American fur trade. For more information, contact MHS reference historian Rich Aarstad at raarstad@mt.gov or (406) 444-6779.

Montana conservation easements protect wildlife habitat and Thompson's route

When David Thompson entered today's northwestern Montana in 1808, he could not have imagined that the pristine wilderness could someday be threatened by excessive human development. Yet in recent years, growing numbers of cabins and second homes have been carved into the forested landscape, damaging fish and wildlife habitat, restricting public recreational access, and reducing timber production.

To help protect the wildlife-rich lands and waters in the Thompson and Fisher river corridors, Montana FWP teamed up with the Rocky Mountain Elk Foundation and other agencies and conservation organizations to purchase permanent conservation easements from Plum Creek Timber Company on 142,000 acres from Libby Dam south to Thompson Falls. Completed in 2003, the massive conservation project dovetails with a previous FWP acquisition of 500 acres around the Thompson Chain of Lakes, halfway along what Thompson called the Kootenai Road. The projects protect Thompson's entire route from the Kootenai River to the Clark Fork River from residential development.



JEFF ERICKSON

More than 142,000 acres surrounding Thompson's route through Montana are now protected.

The conservation easements preserve habitat for elk, moose, mule and white-tailed deer, bull trout, and westslope cutthroat trout. They also provide year-round access for hunting, trapping, fishing, floating, and wild food gathering. A key element in the project is that the land will be sustainably managed as a "working forest" that supplies wood for local and regional forest products businesses. "What's so significant about this project is that it sustains forest management while protecting natural resources and the public's opportunity to enjoy those resources," says Alan Wood, FWP Wildlife Mitigation Program coordinator in Kalispell and a member of the department team that worked on the project.

Three-quarters of the funding for the $34 million project came from the U.S. Fish and Wildlife Service and the U.S. Forest Service, with the balance coming from the state of Montana ($6.5 million), Bonneville Power Authority ($1.5 million), and private donations ($2 million). ■

MICHAEL H. FRANCIS

Rubber boa

Charina bottae

By Sam Curtis

Steve Moore was hiking in the Bridger Mountains last spring when he came across what looked like a giant brown worm, about 2 feet long, lying across the trail. "It was blunt at both ends," says Moore. "I couldn't tell its head from its tail." He knew from past experience it was a rubber boa.

Not wanting dogs or other hikers to bother the snake, Moore tried to move the boa off the trail. "It curled into a tight ball with what looked like its head sticking up in the air, but it really was its tail," he says. "This is a classic defensive posture for rubber boas, sort of a sacrificial pose, that seems to say to potential predators, 'Bite me if you want, but you won't get anything important.'"

Moore slipped his hand under the balled snake, which didn't budge from its defensive posture, and moved it well off the trail where it wouldn't be further disturbed.

Most Montanans have never seen this unique snake, but Moore, an avid hiker, has encountered about a dozen, mainly on forest trails at elevations of 5,000 to 9,000 feet. He once saw a boa with two large lumps in its body. "It looked like it had eaten a couple of mice, whole," Moore says.

Freelance writer Sam Curtis lives in Bozeman.

DESCRIPTION

Montana's rubber boa is the northernmost relative of the giant boa constrictor and anaconda of South America. Like those snakes, it kills prey by squeezing it to death with its muscular body and swallows the meal whole.

The rubber boa's common name comes from its rubbery appearance, the result of small, smooth scales and somewhat loose skin. Its scientific name, *Charina bottae*, is derived from the Greek word *charieis*, meaning graceful, and from the Italian explorer Paolo Emilio Botta, who collected the first specimen in California in the 1820s.

Uniformly colored on its back, the adult snake ranges from tan to brown to olive green. Its yellow underside may be mottled with brown or black. Newborns are lighter in color, appearing tan or even pink and slightly translucent.

Rubber boas are one of the smallest members of the boa family, reaching only 14 to 28 inches long. They have a uniformly thick body, blunt head with small eyes, and blunt tail. Because the head and tail look similar, it is sometimes called the two-headed snake.

Snakes in the primitive Boidae family, of which the rubber boa is a member, have vestiges of hind legs in the form of small "spurs" on each side of their vent, passed down from lizardlike ancestors that lived 135 million years ago.

DISTRIBUTION AND HABITAT

Rubber boas are found from southern California north to British Columbia and east to the Rocky Mountains. They adapt to widely varying habitats, living in arid mountains of California, rainy forests of the Northwest, and inland grasslands. In Montana, rubber boas mainly inhabit forested foothills and rocky areas near water, ranging from the eastern slopes of the Continental Divide westward to the Idaho border.

HABITS

Because rubber boas move slowly and are most active at night and twilight, people rarely see them. The snakes spend much of their time under rocks, logs, and forest litter and in rodent burrows. The only time they come out in the open is when air temperatures are between 65 and 75 degrees.

A rubber boa's bite is rare and harmless. When frightened, the snake coils into a ball with its head tucked underneath and tail sticking out. Many rubber boas have scars on their tails indicating how well the tactic has fooled hawks, coyotes, raccoons, skunks, and other predators.

Because rubber boas are relatively slow, they seek defenseless newborn mice, voles, and shrews still in the nest. (Some tail scarring may be from adult rodents attacking the tail while the snake consumes the young.) Boas also consume small adult rodents, as well as lizards and an occasional bird.

Some scientists believe a rubber boa's home range could be as small as 100 square yards if the snake can find adequate food, cover, and hibernation sites there.

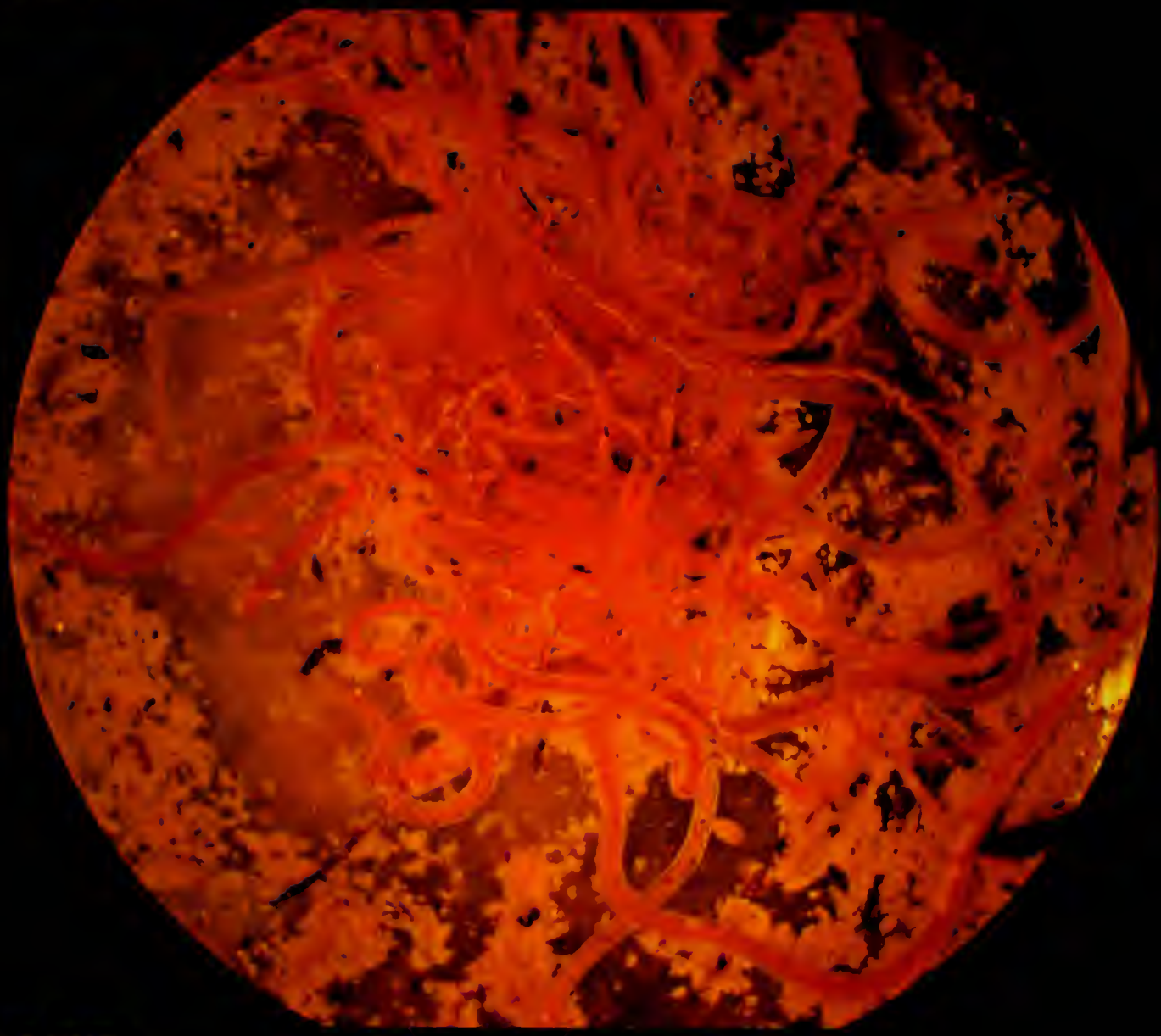
BREEDING

Little is known about the breeding habits of this snake. Mating likely occurs in April or May, and two to eight live young are born in late August or September. The young are thought to hibernate with adults and disperse the following spring. Rubber boas reach sexual maturity when they're about 14 inches long. They may live 15 to 20 years in the wild.

STATUS

Rubber boas are doing well. Globally, populations are considered secure. In Montana, rubber boa populations appear secure, though the species may be rare in parts of its range, especially at the periphery.

PARTING SHOT



BAD HOST

A close-up of tubifex worms, native organisms that live in the muddy substrate of rivers and streams. The worms act as a host for the exotic parasite *Myxobolus cerebralis*, which causes whirling disease in trout. For the latest news on how the disease is affecting Montana trout populations, see page 20. Photo by Silvia Murcia/Montana Water Center.

Ranked Number One

For the past two years, Montana Outdoors has won first place in the state conservation magazine competition held by the Association for Conservation Information.

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